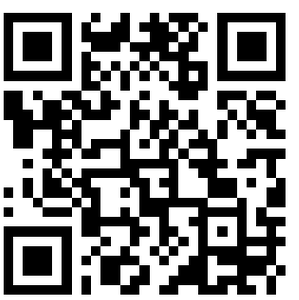
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THE troubles of the Massachusetts officials about the new Medfield Insane Asylum has been smoothed over in a manner which, at least, accords well with the rest of the proceedings in the case. It will be remembered that the work on the buildings was required to be done to the satisfaction of the engineer, or architect, or both of them, we cannot say which. The engineer's supervision does not seem to have given any one much concern, while that of the architect was so far from being satisfactory to the building-committee that he was dismissed. It was, however, apparently satisfactory to the contractors, for, on his discharge, they brought complaints to the Governor, which resulted in the summary dismissal of the three members of the building-committee itself. This left the contractors in sole possession of the field, but, under the contracts, the work had to be done to the satisfaction of somebody, and, as any other architect than the victim of the recent circumstances appeared to be distasteful to the contractors, they were, according to the Boston papers, invited to name some person to whose satisfaction they would consent to do their work. In accordance with this request, they graciously proposed the name of a contractor, who had for many years, previous to entering into business, been bookkeeper in a builder's office. This nomination was, it is said, immediately accepted and confirmed by the Governor and Council.

MEANWHILE, three new members were added to the Board of Trustees of the Asylum, and a new building-committee was chosen from among the trustees, the building-committee, this time, containing a member who ought to have been on it from the first, Dr. Park, an expert in hospital and asylum administration, and probably the only one of the trustees whose advice in regard to questions of design and construction, other than those which the architect was the proper person to answer, would be of any value whatever. Meanwhile, nothing seems to have been done about appointing another architect. Whether such a personage appears to the Governor and Council superfluous, or whether the appointment is only delayed, we cannot say; but the spectacle of the contractors for a million-dollar group of public buildings going on with their work without supervision or direction from any architect, under terms which require them only to make their work satisfactory to a book-keeper, who owes his appointment to them, is one to make enterprising builders dance for joy.

THERE are circumstances under which the lamp of life is extinguished, in which even the slight dread with which Christian man contemplates the inevitable coming of death is altogether lost sight of. To have the thread of life snapped on Christmas day while engaged at the church door in bestowing alms upon one's needy neighbors is an ending each one of us would be glad to welcome. Unusual as these conditions are, such were those which attended the death of Robert C. Fisher at the door of Trinity Church at New Rochelle, N. Y. The act, half real charity, half the expression of kindly neighborly feeling, was but the crowning of many charitable acts in which Mr. Fisher delighted to employ the large wealth which he had acquired as one of the largest dealers in marbles and fine building-stones. While the element of pathos is altogether absent in the case just cited, there is abundance of it in the circumstances which have led to bring mourning upon those interested in another business in which architects in this country have an indirect interest. On November 27, Stephen Wilcox, the junior member of the well-known firm of the Babcock & Wilcox Company, died and in less than three weeks his life-long friend and partner, George H. Babcock, followed him to a better world. Mr. Babcock was, we believe, that one of this pair of friends upon whose skill as an inventor the firm founded its first successes and its later large business. Born in 1832, in humble circumstances, Mr. Babcock led the life that usually falls to the lot of successful self-made men, and like so many others his first step was taken as a printer and newspaper editor. This led to his engaging in the manufacture of printing-presses and while engaged in this work he evidently discovered that certain powers were dormant in him, for we find him next studying for several years in the office of a patent lawyer and helping to support himself by teaching mechanical drawing at the Cooper Institute. Later he was employed in sundry iron-working establishments in Connecticut and Rhode Island, during which time he encountered Mr. Wilcox, and with his aid perfected his inventions and established a business which is known in every quarter of the globe.

IN a paper read a few months ago before the Boston Society of Civil Engineers, and reported in the *Journal of the Association of Engineering Societies*, Mr. M. M. Tidd calls attention, from the engineer's point of view, to a matter which we have already repeatedly discussed from that of the architect, — the crying need of a change in the manner of taking expert testimony before the courts. Mr. Tidd does not enter, as he might, into the ludicrous exhibitions of ignorance and assurance which are constantly made in court by the creatures whom lawyers provide, under the name of experts, to impose upon juries in favor of a client whom they know to have no case, and whose testimony is accepted as of equal weight with that of the masters of the profession, but he says, with only too much truth, that the present system, under which each side employs experts solely to help its own case, and the experts on either side are pitted against each other, brings disrepute on the experts, and on the profession which they practice. Mr. Tidd thinks that the engineers, or architects, or whoever they may be, who are called as experts, are so much influenced by their friendship, or sense of obligation, to the person by whom they are employed, that their testimony is unconsciously inclined in favor of his side, and that the opposite bias of the two sets of experts gives rise to those contradictions which are so often observed in such testimony, and which are so fatal to the reputation of those that give it.

A CERTAIN length of experience with expert testimony leads us to think that Mr. Tidd, while right as to the fact of the frequent occurrence of humiliating contradictions in such testimony, is wrong as to the cause. We are sure that there are few engineers or architects who would be led, by any amount of friendship, or sense of gratitude, to vary a hair's-breadth from a clear and precise statement of the truth, as they understood it; and almost always the difficulty with such testimony is that the witnesses, instead of speaking about the actual state of the case, testify in relation to a certain compound of half-facts, unintentional errors, intentional misstatements and omissions, constructed by the counsel for the side that employs them, which they suppose to be a faithful presentation of the whole question. These structures of hypothesis are propounded to them in the lawyers' offices, where their testimony, based upon them, is carefully rehearsed; and, as each lawyer has a structure as different from that of the

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opposing counsel as it is possible for legal ingenuity to make it, the natural result is that the ideas of the experts on the opposite sides, as brought out by carefully chosen questions, appear to differ. It is true that a skilful cross-examination, by one of the few lawyers who know anything whatever about engineering matters, will readily elicit the truth from such a witness; but lawyers generally cross-examine a witness to confuse him, not to get the truth from him, and, at the best, it discredits an expert to find that his answers to a cross-examiner differ from those given to the lawyer on his own side under direct examination. As a specimen of the gross misrepresentations of facts which are often submitted to experts for their opinion, Mr. Tidd mentions a case where the owner of a water-power, which partly supplied a mill, sued a town for damages, for diverting a portion of the water. The water-power was unreliable, and the mill was supplied with a steam-plant for running it without any aid from the water-power. It was agreed on both sides that the amount of water-power diverted by the town did not exceed seven horse-power. The town offered to pay for coal enough to replace this amount of power, but the mill-owner claimed that the proper damages would be a sum sufficient to provide a seven horse-power boiler and engine, with power-house and equipment, and the salary of a man to run it. In support of this theory, he swore on the witness-stand that his present steam-plant was taxed to its utmost capacity, and that he could not get another horse-power out of it. At this point the court adjourned for two days, and, as the mill was then running under steam alone, the experts for the defendant took it into their heads to inspect the plant for themselves. They found a fine plant, but, in addition to driving all the mill machinery, they discovered that the engine was driving three thirty-horse-power turbines, each with eight feet of water over it, which were permanently connected to the other end of the main shaft. They hunted up the engineer, who appeared to be an intelligent man, and asked him how much power he thought was wasted in driving the turbines, in addition to the mill machinery. He thought it was fifty or sixty horse-power, and, in answer to another question, said that he could easily get ten or fifteen horse-power more out of the plant if necessary; so that his unperverted testimony went to show, and did show, afterwards, in the court, that the steam-plant which its owner averred upon oath to be incapable of furnishing a single horse-power beyond that required to run his mill, was furnishing at the moment at least fifty horse-power more, and could have given a surplus of sixty to seventy-five horse-power.

THE remedy which Mr. Tidd proposes for this unsatisfactory and discreditable state of affairs is precisely that which we have often advocated, — to have expert witnesses called by the courts alone, and the expense of employing them added to the court costs. This is the practice in France, and the results are very satisfactory, while the saving in expense to the contestants is enormous. The first step there, in a case which evidently requires expert evidence, or in which the parties ask for it, is for the court to send to the ground one, two or more experts, according to the importance of the controversy. These are chosen out of a small number of architects or engineers, whose reputation for technical knowledge, cool judgment and integrity has gained them the valuable appointment of "expert before the courts," and nothing more is done until they have rendered to the court their report as to matters of fact, which is taken as the basis of the decision. There is no reason whatever why our State or United States Courts should not be authorized to proceed in the same manner, to the great advantage of the public.

IT seems that the code of medical ethics in England is regarded by the judges there with about the same consideration that is accorded to the regulations of other professions, and there is a certain satisfaction in observing that architects are not the only victims of the judicial vituperation which forms so picturesque a feature of English law-practice. Some time ago a certain Mr. Anderton was called in to attend a sick person who had been a regular patient of a Mr. Ashurst. It is well known that medical etiquette requires a physician who has been called to visit a patient who has previously been under another physician's care to notify the latter of the fact. Mr. Anderton neglected to do this, and Mr. Ashurst, indignant at the slight, sent him a telegram saying, "Your conduct is abominable, and I shall not fail to resent it." It was now Mr. Anderton's turn to feel aggrieved, and he sent to Mr. Ashurst demanding an apology for the telegram. With us, a man receiving such a message would, if his conscience were clear, have laughed, and thrown it into the fire, but telegraph offices seem to be managed in England on different principles from those followed here, for Mr. Anderton, not receiving the apology he desired, brought suit against Mr. Ashurst for libel, on the ground that the contents of the telegram would be, or had been, divulged about the town in which he lived, and would injure his practice. The case was tried at Manchester, and the jury seems to have sustained the plaintiff's idea that the contents of telegrams should be considered as having been published to the world, for it gave him a verdict, assessing the damages, however, at one farthing. Meanwhile, the judge, with the usual airy discursiveness of the British judiciary, expounded, for the benefit of the spectators, his views on the case, and on doctors generally. As to the claim before the jury, he said that it was "a most trumpery one," and having thus disposed of the plaintiff, he proceeded to score the defendant, saying that he had no sympathy with the rule which forbade what he was pleased to call "violating the right which doctors claim of a monopoly to kill." He went on to say, "I know doctors claim a right not to be interfered with, but the public have as much right to change their doctor as they have to change their baker." We have read a good many stories of the sayings of English judges, but for insulting and ignorant mendacity we have never seen anything that surpassed this deliverance. How long an American judge would stay on the bench who declared before a jury that physicians claimed "a monopoly to kill," we cannot say, but it would not be long. As to the extraordinary assertion that doctors claim "a right not to be interfered with," and the suggestion that anybody in the medical profession denies the right of the public to change their doctor as often as they like, it is most charitable to attribute them to ignorance, combined with indigestion, but their effect in misleading a jury would not be less than if they were inspired by deliberate malice, and as far as the public is concerned, the medical profession in England now stands charged, on the authority of a judge addressing the jury in open court, with having devised its rule, that a new physician shall give notice of having been called to the one who has previously had the patient in charge, not for the well-being of the patient, which is obviously promoted by putting the two physicians in communication, but for the purpose of securing to each member of the profession his "monopoly to kill"; while the fact that people change their doctor quite as freely and frequently as they do their baker, without the slightest objection from the profession, is, by implication, denied, in order that this ridiculous charge against the members of one of the noblest and most self-sacrificing of all callings may not immediately refute itself.

THE *Scientific American* copies from the *Pacific Medical Journal* a letter from a California physician in regard to solar cautery, which he has used in place of caustics or other forms of cautery, with the happiest results. He finds that, by concentrating the sun's rays, by means of a lens, upon morbid tissue, the portions to be removed are destroyed with less pain, and less injury to the surrounding tissue, than by any other process; and he thinks that the chemical rays of the sun have "a curative power as yet unexplained." He applies a high degree of heat, so as to carbonize the tissues at once, without blistering, and finds that the pain ceases as soon as the operation is over. In one case, where he had to burn the skin off nearly all one side of the face, at one sitting, the surface was free from pain in five minutes after the cautery was stopped. Probably this effect is due less to the curative power of the chemical rays than to the concentration of the heat. It is well known that a cautery with a white-hot iron is much less painful than one with an iron at a low red heat; but even the white-hot iron blisters and scorches the tissues at a little distance from it, by the radiated heat, while, with the solar cautery, there is practically no radiated heat, whatever the temperature of the focus may be. The *Scientific American* mentions that this method of cauterizing was patented by Augustus Barnes, of Connecticut, in 1867, but no particular notice seems to have been taken of the invention, and the patent has long expired, so that any one who wishes to burn off warts, or apply the treatment to unhealthy ulcers, which are said to be often cured by it, can do so without asking permission.

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OFFICE-HELP FOR ARCHITECTS.[1]—XXII.

CHAPTER VIII. — WALLS.

SECTION I. — MASONRY WALLS.

§ 301. Materials: — Masonry walls are built of some imperishable, non-combustible material, usually bound together with mortar. The materials usually used, either separately or in combination, are brick (face and common), stone and concrete. According to the duty they have to perform, they are divided into;

Class I. — Bearing-walls or walls that carry the beams or girders of a building.

Class II. — Curtain-walls or walls that have only themselves to sustain, with an occasional floor load.

Each class should be sub-divided into:

(*a*) Homogeneous walls, or those built throughout of one material.

(*b*) Non-homogeneous walls, or those that are built with a facing that does not bond with the backing, or has a different rate of shrinkage.

§ 302. Strength: — The strength of walls is usually limited by the strength of the mortar. Walls that belong to Class I (*b*) or Class II (*b*) are only as strong as walls of the thickness of the backing, the facing not counting unless it is equal to or exceeds 12″ in thickness and then only for the strength of the backing. In Table XXXIV safe practical values are given for the strength of walls, but when Portland cement is used to get as great strength as possible, great care must be used in all of the operations to get the desired results. Walls should never be strained in tension, should never be subjected to vibration and should be so designed as to be sufficiently stable or secure against failure by buckling.

§ 303. Stability: — The stability of a wall is secured when three conditions are fulfilled:

(*a*) When its clear height is not too great for the thickness.

(*b*) When it is thick enough to resist the pressure against it by the earth, water, wind, or other fluid or solid.

(*c*) When it can receive the thrust due to rafters, arches or the like without being overthrown.

Case (*a*): — All walls of Class II should be examined for the fulfilment of this condition. Under this class come many of the front and rear walls of city structures, the filling-in walls of all skeleton constructions, chimneys, the enclosing walls of courts, gable walls of churches, libraries and the like.

If a section of the wall of a length equalling the thickness and of a height equal to eleven times the thickness is sufficiently strong to carry the superimposed weight according to Formula 3, § 172, the wall fulfils condition (*a*). In walls of Class I whenever the height of a story exceeds twelve times the thickness, take a section of wall equal to the thickness and ascertain whether the superimposed load is within the limits of strength. All piers and columns of masonry should be examined also to see that they are sufficiently strong, remembering that the wind-pressure on a tower will often concentrate the weight of the entire tower on one pier or wall.

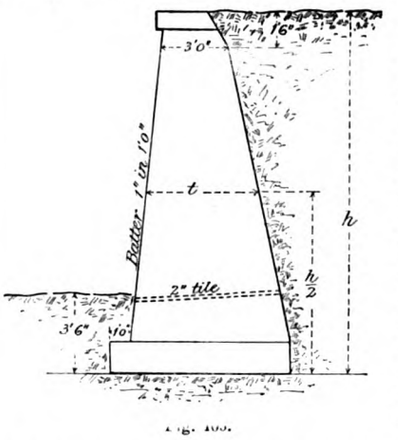


Fig. 105.

The requirements of the majority of our municipal building-regulations are such as to give safe thicknesses for gable walls, etc., when properly built and permitted to set before being strained.

Case (*b*) *Lateral Pressure: Earth:* — To resist the earth-thrust with a retaining-wall, proportion the wall by the following:

t in inches, h in feet.

$$t = 3.7\,h \qquad (81)$$

or of sufficient weight to resist P in Formula 54.

For walls sheltered from frost, the free face of the wall should batter 1″ per foot and the rear be so battered as to make the average thickness not less than t. Where frost must be resisted, the wall should go 3′ 6″ below grade, unless frost

TABLE XXXIV.

STRENGTH OF VARIOUS KINDS OF MASONRY WALLS.

Material of wall.	Parts of				*Sc*	
	Lime.	Rosendale.	Portland.	Sand.	Tons per sq. ft.	Pounds per sq. in.
Common brick	1			2	3.0	41.7
"	2	1		4	5.5	76.2
"	1	2		4	6.0	83.0
"	1	3		6	7.0	97 0
"		1		5	6.0	83.0
"		1		4	8.0	110.0
Common hydraulic pressed brick		1		4	8.0	110.0
"		1		3	10.0	139.0
"		1		2	12.0	167.0
"		1		1	15.0	208.0
"		4	1	10	12.0	167.0
"		3	1	10	14.0	194.0
"		2	1	10	15.0	208.0
"		1	1	6	15.0	208.0
"		1	2	10	18.0	250.0
"		1	3	10	20.0	278.0
"			1	4	20.0	278.0
"			1	3	25.0	348.0
"			1	2	30.0	417.0
"			1	1	40.0	555.0
Common rubble		1		4	8.0	110.0
"		1		3	10.0	139.0
"		4	1	12	12.0	167.0
"		2	1	6	15.0	208.0
1st class rubble		1		3	10.0	139.0
"		1		2	12.0	167.0
"		1		1	15 0	208.0
"		3	1	10	15.0	208.0
"		2	1	8	18.0	250.0
"		1	1	6	20.0	278.0
"		1	1	3	25.0	348.0
"			2	5	25.0	348.0
"			1	2	30.0	417.0
Ashlar			1	6	15.0	208.0
"			1	5	18.0	250.0
"			1	4	20.0	278.0
"			1	3	25.0	348.0
"			1	2	30.0	417.0
"			1	1	40.0	555.0
Ordinary concrete	5	1		3	8.0	110.0
"	4	1		2	10.0	139.0
"	30	4	2	16	12.0	167.0
"	15		1	6	15.0	208.0
"	12		1	5	18.0	250.0
"	6		1	4	20.0	278.0
"	5		1	3	25.0	348.0

[1] By George Hill, Consulting Engineer. Continued from No. 931, page 45.

ABBREVIATIONS AND SYMBOLS.

= equal to. ∴ therefore.
|| parallel to. □′ square feet.
÷ divided by. □″ square inches.
× multiplied by. 8# read 8 pounds per lineal foot.
+ added to. [channel bar.
a^2 a multiplied by itself. I I-beam.
$a > b$: — a greater than b. T T-iron.
$a < b$: — a less than b. L angle iron.
$\frac{a}{b}$: — a divided by b. ⊥ deck beam.
● round section.

I ton = 2,000 pounds as this is the conventional ton, the legal ton is 2,240 pounds, but is rarely used.
l = the length between supports of any beam or girder or height of any column, always in feet.
b = breadth of any beam or girder, always in inches.
d = depth of any beam or girder, or the least transverse dimension of any column, always in inches.
L = total load uniformly distributed coming on any piece in pounds.
L^{pr} = " " " " per square foot in pounds.
W = concentrated load on any piece in pounds.
s = span of any arch or truss between centres of end pins in feet, or spread of footing courses.
A = area of any section in square inches.
M = maximum bending-moment in inch pounds.
n = distance of centre of gravity of section from either top or bottom edge in inches.
I = moment of inertia, neutral axis through centre of gravity.
R = moment of resistance of section.
r = radius of gyration, in inches.
Sc = safe compressive strain in pounds per square inch.
St = " tensile " " " " " "
Ss = " shearing " " " " " "
S = strain per square inch in extreme fibre.
P_e = upward reaction of support at left-hand end of beam.
P_f = " " " " " right " " " "
e = distance of centre of gravity of load from left hand of beam.
f = " " " " " " " " right " " "

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is known to go deeper; h should be figured from the bottom of the wall, t should be made what the wall requires, making the top in all cases 3′ 0″ wide; the top 1′ 6″ should be chamfered off at 45° from the vertical, and the slope and the entire back for the free height of the wall should be pargeted with Portland-cement mortar, 1 to 3. After pargeting, the wall should be damp-proofed with asphalt, and every 4′ 0″ should have a 2″ tile-pipe built-in just below the grade to afford an escape to the water flowing down the back (Fig. 106). Resistance of earth-thrust of vault-walls is given in Chapter VII, § 258. Walls of buildings are not loaded like retaining-walls, and the thickness is fixed usually by conditions of strength. For buildings of 50′ 0″, or less, in height, use thickness as in Table XXXV.

TABLE XXXV.

THICKNESS OF FOUNDATION WALLS.

Class of building.	Depths. 3′ 6″	5′ 0″	10′ 0″	15′ 0″
Ordinary frame dwelling.....	8″	12″	12″	16″
Good ordinary frame dwelling..	12″	12″	16″	20″
Heavy frame buildings.....	16″	16″	20″	24″
Common brick buildings.....	12″	16″	16″	20″

Water-pressure: — Let t and h be as before, then the proper size of wall to resist the water-thrust will be:

$$t = 7.2\,h \qquad (82)$$

If the wall is held at the top, the bending-moment will be

$$M = 6.92\,h^3 \qquad (83)$$

In cisterns the water-thrust is resisted in part by the earth-thrust, and the bending-moment due to the earth should be

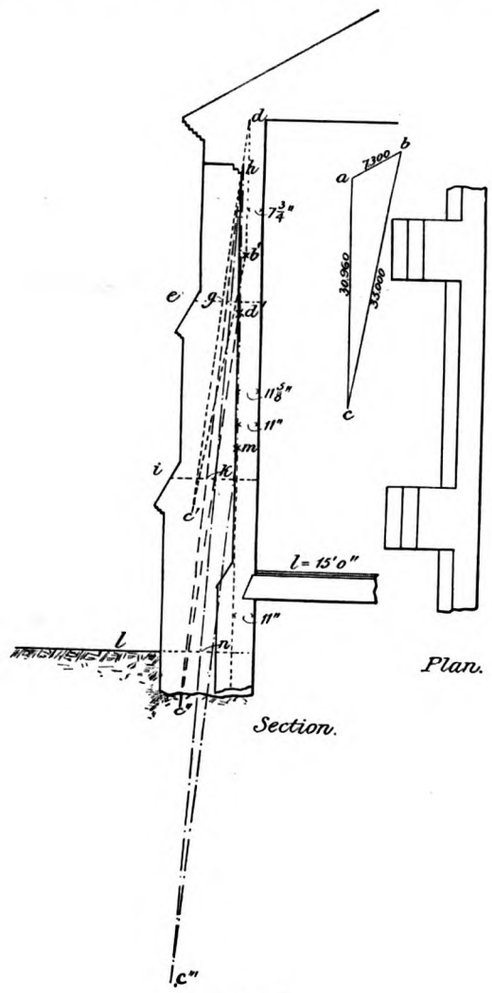


Fig. 107.

found and the wall proportioned to resist the difference found by subtracting Formula 56, §258 from Formula 83.

When dams are to be built, the proper section should be taken from Fanning's "*Treatise on Hydraulic Engineering*," if the dam is of any size; if small, proceed as for a retaining-wall for earth determining t from Formula 82. For grain or other fluid, change the factor in Formula 83 in the ratio that the weight of the material bears to the weight of water.

Wind: — Wind has a twofold effect, one to overturn the wall, and the other to blow in the central portion. To resist

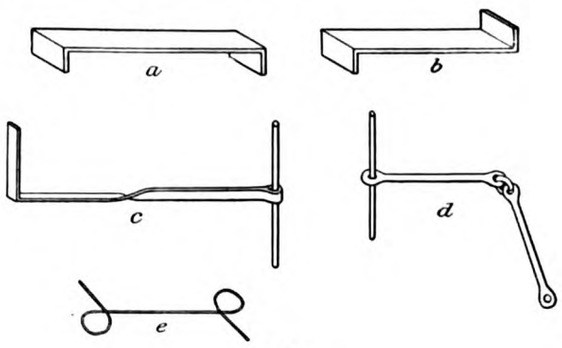


Fig. 109.

the first, the wall should be braced by means of buttresses or transverse walls wherever practicable, and to resist the second, the thickness of the wall between buttresses should equal in inches six-tenths of the distance between the buttresses in feet, or the nearest size next above the amount so found; and the wall for at least one-third of its total height must be solid and of uniform thickness. The buttress should be on the inside wherever practicable.

Case (*c*), *Thrusts:* — Thrust for arches or wind-pressure of trusses is most economically resisted by buttresses, transverse walls or by horizontal trusses transferring the horizontal component of the thrusts to transverse walls. To determine the amount and direction of the resultant of the thrust and the weight of the wall or pier, proceed as follows (See Fig. 107.): Take the case of the truss shown in Figure 67, assuming that the walls are 24′ 0″ high, that the wind is from the right, and in consequence we are resisting the resultant or reaction from the fixed side, and that the material of the walls is brick, weighing 120 pounds per cubic foot. We should then have the resultant of the wind-pressures on the right as given at ab on the small diagram, the static load as ac, and the resultant of both bc. The requirements are that the resultants shall successively pass through the middle third of the sections that we are considering, which in this case are e, i and l. Considering the section de, we should have the load from the curtain-wall 11,020 pounds with its centre-of-gravity 6″ from the rear face. The buttress would have a weight of 6,840 pounds with its centre-of-gravity 16″ from the rear face of the wall. The distance then, between the two centres-of-gravity is 10″. To determine the position of the centre-of-gravity of the two, we have the proportion: 17,860 pounds (total weight) is to 11,020 (one of the partial weights), as 10 (the distance between the two centres-of-gravity), is to $8\frac{1}{4}$ (the distance to the common centre from the smaller of the two masses.) This makes the centre-of-gravity of the whole mass $7\frac{3}{4}$″ from the back edge of the wall

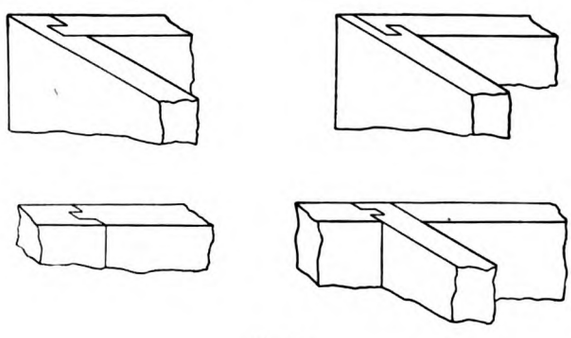


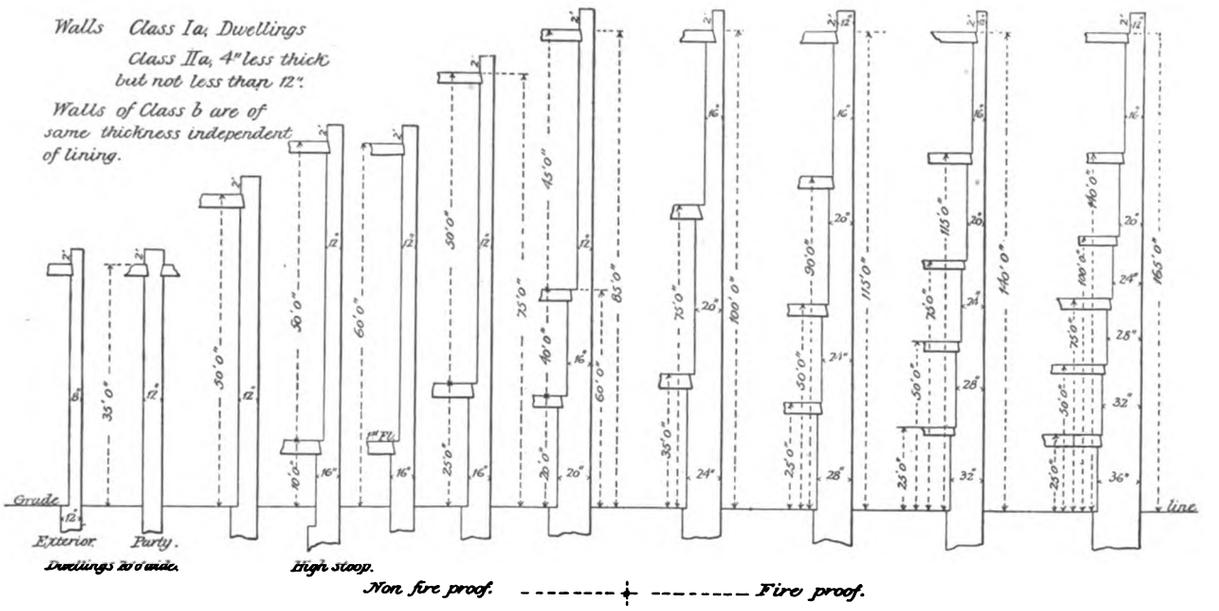
Fig. 110.

or in the line $b'd$. At d, the point of application of the load from the truss vertically over the centre-of-gravity, draw the line db', representing the weight of the buttress and curtain-wall. From b', draw $b'c'$ equal to bc in direction and amount,

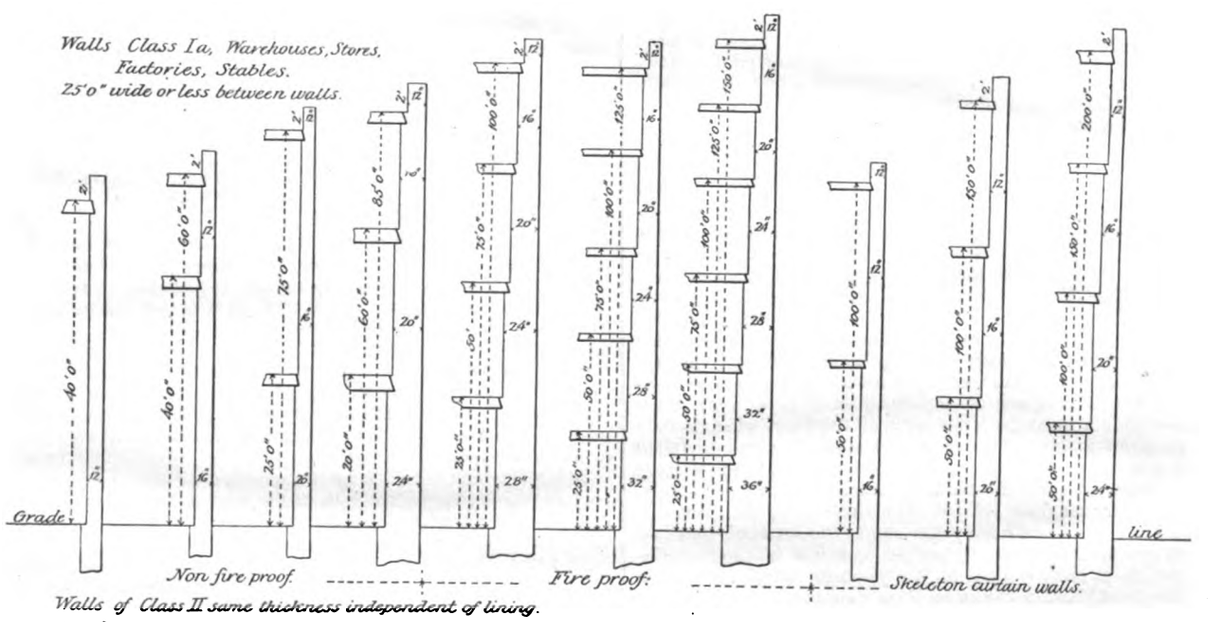
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then dc' will be the resultant of these two forces which cuts the joint e at the point g showing that the first section is safe. Now, considering the joint i, we would have the curtain-wall weighing 11,020 pounds as before, with its centre-of-gravity 6″ from the back of the wall; the buttress 7,700 pounds, with its centre-of-gravity 20″ from the back of the wall and the centre-of-gravity of the whole 11⅝″ from the face of the wall or in case, the effect of the floor is added to the weight of the masonry to draw the resultant still further in. The line of pressures through the buttress will be a line connecting g, h and n.

Should the analyses throw the line of pressures at any point outside of the middle third, the size of the buttress or the weight of the curtain-wall must be increased so as to keep



Note – 8" walls may be used for interior partitions provided lot is less than 33'0" wide – clear span then limited to 26'0", length to 50'0".
If clear span is more than 26'0" increase walls 4" for each excess of 12'6" in span.
For two dwellings on 25'0" lot alternate walls may be 8" thick.



Walls of Class II same thickness independent of lining.
All walls more than 105'0" deep without a crosswall must be increased 4" in thickness for each 105'0" or fraction thereof in depth.
Walls more than 26'0" apart must be increased 4" in thickness for each 12'6" excess of span.
Materials may be concentrated in piers or buttresses.
Walls of Class b may be 4" less in thickness but not less than 12"
All walls must increase 4" in thickness for each 10% excess of flue area or opening area greater than 25% of the total area in plan.
When walls are hollow the same amount of material must be used and ties inserted each 4'0"

Fig. 108.

the line mh. From h, the point where dc' cuts a line drawn vertically through the centre-of-gravity, measure off the line hd', representing the weight of the buttress. From d' draw $d'c''$, equalling dc' in direction and magnitude, and draw the resultant hc'' cutting the joint at k, which is within the middle third. The treatment of the section at l is similar, the resultant running to c''' and cutting the base at the point n. In this it within, as only under these conditions can stability be insured.

§ 304. Sizes: — State laws or municipal regulations fix the sizes for many of the larger cities and then the thickness must accord therewith, regardless of the duty to be performed. As a consequence, the material and the mortar should be such as to give the required strength and no more. For the ordinary

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conditions of building the strength of the wall should be about ten tons per square foot and the sizes required by the New York Building Law followed. (See Fig. 108.) Note that no load should be put on the 8″ partitions when run up the maximum height without any intermediate beams, and that the 4″ partitions should not be loaded at all.

§ 305. Bonding: — Bonding is the interlocking of the several parts of the wall so as to render the movement of individual parts thereof difficult for brickwork. Similar principles apply to all other masonry walls. Several kinds are shown in Figure 7. Walls belonging to Classes I (*b*) or II (*b*) may be laid up separately and tied to the backing with Morse wall-ties *c* (Fig. 109), as often as the horizontal courses come even, the ties being spaced 8″, *c* to *c*, longitudinally. For stone facings of 8″ or less thickness, each stone should be anchored with a galvanized-iron anchor, *a* and *b* (Fig. 109), and the coursing of the stone should be so laid-out as to bring it right with the brickwork. They should be carried at the level of each story by means of a course of stone projecting into the wall a sufficient amount to carry the facing for a height of one story, as shown in Figure 110, and the best practice is to make the thickness of the ashlar but 4″. Where it is desired to have rather a stronger facing, or necessary to carry it to a greater height, the stones might be made with every third course 8″ deep, bonding into the brickwork. In all solid stone walls each face should have one-fifth of its area of stone passing at least twice as far into the wall as the other four-fifths does.

Coursing: — Coursing is shown in Figure 5.

[To be continued.]

HARDWOOD JOINERY.[1]

PROBABLY modern hardwood joinery would have been a better title for the present paper, as at the request of your President, it deals more especially with this branch of the subject, mediæval work only being referred to incidentally; cabinet-making, intarsia, etc., are also outside its scope, as they are really distinct trades.

Hardwood joinery may be considered from various points-of-view, from the elaborate vaulted canopies of a cathedral worked almost entirely by hand, to the simplest domestic fitting, now produced to a very great extent by machinery, but each giving scope in a greater or lesser degree for the skill of the workman. For its production, if the work is to be really good, two things are absolutely essential — good workmen and good, well-seasoned wood, for it is as impossible for a good workman to produce satisfactory work with bad material as it is for an inferior workman to turn out creditable work, however good the material may be. A short review of some of the hard woods more generally used may, therefore, be of interest at the outset.

Oak seems naturally to take the precedence, and of this there are several varieties — English, Russian, Hungarian and American being the principal; of these English still stands unrivalled for strength and durability under exposure, but it has been superseded to a very great extent for internal fittings by the others, which are easier to work, and from their milder nature less liable to twist or crack. English oak-trees are usually felled early in the year, when the sap has risen, on account of the value of the bark, which is then easily stripped off and used for tanning leather, but oak so felled takes about two years longer to season than that felled in the winter; in the latter case, however, the bark cannot be stripped off, and is, therefore, wasted. English oak-trees at times produce planks of great width; one cut down some years ago at the scene of your last summer excursion, Diss, yielding perfect ones five feet wide. Undoubtedly the finest oak available of late years for inferior work has been the variety of Russian known as Riga wainscot, the grain being very fine, close and regular, the wood a good color and easy to work. But the logs, never very large, are now smaller than ever; in fact, it is very difficult to get them at all, the supply being nearly exhausted. Several other kinds are also shipped from Russian ports; these are principally cut from small trees, the grain is coarse, and as a rule they are unsuitable for good work. Hungary produces a very fine variety of oak. The logs are much larger than any formerly shipped from Riga, and at the present time this is certainly the best oak available in any quantity, its great width making it specially valuable for panels. This is shipped at Fiume, in the Adriatic. It should be remembered, however, that Hungary, as well as Russia, also produces some very inferior sorts. America sends large quantities of oak to this country, but it is not equal either to Riga or the best Hungarian. The grain is very open, the color poor, usually with a pink tint and generally speaking is unsatisfactory for high-class work. The silver grain is a distinguishing feature of oak, and produces the figure; the radiating lines of this can be seen in any section; these lines are absent in chestnut, and in many cases form, probably, the only way of distinguishing the two woods. If the various samples of oak before you are compared with that of chestnut, this will be at once apparent. One other point respecting oak is worth referring to — the term wainscot. This does not distinguish any particular variety or locality, but is applied indiscriminately to all logs cut on the quarter. Mahogany next claims attention, the different kinds varying considerably, that known as Spanish, coming from San Domingo, being the most valued. In the past this has been extensively used, but is now very scarce, its place being taken by another Spanish variety, found in Cuba, which is very close-grained, hard and of good color; but the kinds more generally used at the present time are obtained from Tabasco and British Honduras; Panama and Africa also send mahogany to this country, but the quality of both is very poor. Of walnut, five descriptions deserve notice, Indian coming first, both for closeness of grain and beauty of markings. This is difficult to obtain at the present time, but a variety much resembling it is now imported from Circassia. English is lighter in color and not so richly marked. A totally different kind, known as black-walnut, is shipped at Quebec; it is much softer than the others and almost devoid of markings, but can be obtained in large sizes and is not likely to crack. A lighter shade of the same wood is shipped at New York and other United States ports. Teak is imported from Burma, and is especially valuable for work exposed to the action of sea-air and salt-water; it is also coming into very general use for hospital floors; a variety is found at Bangkok, but the color is not so good. Many devices have been tried for artificially drying hard woods in a short time, but all seem open to objection of some kind or other, and allowing the wood to season by the natural action of the air on the boards and planks is, after all, the most satisfactory, although, of course, it is a long process. But it is time to pass from the material to the various methods of working it.

Starting at the beginning, the selection of the wood before it is cut to size is more important than appears at first sight, for on this much of the final appearance will depend, and too much care cannot be exercised at this stage, for carelessness in matching will prevent the work ever looking really well, and most likely result in considerable waste. Cutting to length and width is now done entirely by steam saws. Afterwards the wood is passed through a trying-up machine, which planes it to thickness and width, leaving it quite true and ready for moulding. Mortising and tenoning are also done by machinery, and absolute truth secured. So far, machinery is of advantage in every way, and, in addition, it also relieves the joiner of the very hard labor necessary before its introduction, leaving him free to devote all his energies to the remaining parts of the work, in which a good workman will find plenty of opportunity to display his skill. Up to this point the preparation of all hardwood joinery is practically the same (nor does it differ materially from soft woodwork), but as in its further stages the methods diverge considerably, it will be well to consider these under two broad heads: — First, the simpler forms, in which machinery continues to play an important part; and afterwards the more elaborate work, which has frequently to be done almost entirely by hand. Formerly, mouldings were worked either by planes of various shapes or by routers; the latter were of steel, much the same as modern machine irons, but let into a piece of wood and worked backwards and forwards by hand — a long and tedious process. One or two of these planes and routers are on the table for reference. The introduction of machinery has, however, done away with both these methods, so far as the ordinary mouldings used for domestic fittings are concerned. In such work the mouldings can and should be turned out in such a manner as not to need touching by hand, and when cost is of great importance care should be taken that the sections are such as can be worked by passing once only through the machine. A few examples of mouldings so worked are before you.

Before further considering the question of sections and the important bearing they have both on the appearance and cost of work, it may be of advantage to call attention to the practice followed of cutting boards and planks to the nominal thicknesses of 1 inch, 1¼ inch, 1½ inch and so on, but as the saw-cut and planing have to be taken out of this, they never hold the full thickness when worked-up, 1 inch finishing ⅞ inch; 1¼ inch, 1⅛ inch; 1½ inch, 1⅜ inch; therefore (paradoxical though it may seem), it costs more to produce work 1¼ inch thick than 1⅜ inch, for 1½ inch boards must be used in each case, but there will be increased labor in reducing them to 1¼ inch. Planks also finish about ¼ inch less, and wide English oak ones sometimes even ½ inch less, as, on account of the greater strength of their grain, the latter are more liable to twist in drying; by keeping this in mind unnecessary waste may frequently be avoided. It should also be remembered that cornices, cappings and similar mouldings will stand infinitely better if built up, and be far less likely either to twist or crack than if made solid, the result being better work at less cost; care must, however, be taken that each part is properly tongued or cross-tongued. There are several sections of actual work on the table which will show the system fully. Attention is specially called to many of these sections, and particularly to the ebony frame, which show what effective mouldings can be obtained from thin material.

Construction deserves more than a passing notice, for on it very much depends, and every detail should be carefully thought out. It is difficult to lay down any hard-and-fast rule on the subject, as each work should be considered on its merits, but mortises and tenons are always safe and reliable. In the case of very thick doors, however,

[1] A paper read by Mr. H. W. Barnes before the Architectural Association, (London).

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THE AMERICAN ARCHITECT AND BUILDING NEWS

ADVERTISERS' TRADE SUPPLEMENT.

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HEATING AND VENTILATING, AS APPLIED TO MANUFACTURING ESTABLISHMENTS.

ALTHOUGH a perfect success for heating and ventilating shops that are only one story high, in the most economical manner, the true merit of the Smith Hot-Blast System becomes the more apparent as the height of the building increases. The apparatus is made in all sizes, so as to accommodate buildings of any dimensions, and is also made in any special size for the convenience of any peculiar location. The apparatus is generally located in the basement of the building, at a point best suited to harmonize all of the surrounding conditions, and from it the heated air is conducted throughout the basement by means of galvanized-iron pipes, suspended beneath the first floor, and is thence distributed throughout the building through risers extending to the upper floors. This is the application of the system to a building that has been completed, but in new buildings the air is conducted to its destination by means of flues built in the walls. Registers are arranged in the walls of the room to be heated, near the ceiling, so that the warm air is taken into each apartment or floor near the top, keeping the entire apartment well warmed with pure and ever-changing air. The great convenience of the system is that the whole building is warmed with only one fire, and there can be no leakage of any kind at any other point than where the heater is located, and the economy of it is that the work is done with seventy-five per cent of the power used by any other system, and that where the steam is needed for other purposes than for heating, the efficiency of this system is so complete that, save in the coldest weather, the entire building is heated with exhaust steam. In manufactories using this system the rate of insurance is lower than where any other system is employed, as the heating-surface is confined to one place, generally in the basement of the building, often in a separate apartment and is surrounded with and enclosed by a steel jacket, making it absolutely fireproof.

There is an entire absence of steam-pipes to break, leak, freeze up, or get out of order, and there is no weight upon the floors throughout the building, as the air is conducted through the flues in the walls, which permits the use of every foot of floor-space, without fear of injury from accidents of any kind to fabrics or goods liable to be easily damaged.

The largest buildings are quickly heated, and when the heat is allowed to go down at night the only thing that is necessary to have the apartments warm when the employés come to work in the morning is, that the apparatus should be started up an hour or two before the time for commencing work. By running the engine slowly all night, the building may be kept at a moderate temperature, and thus be more easily heated to the desired point in the morning. This is very readily done when the Heater is supplied with one of the Smith High-Speed Vertical Engines, which are such perfect pieces of mechanism that they require the minimum of attention and always do their work perfectly.

In writing for estimates send a plan of the building, giving full description of the same, window surfaces, height of ceiling, etc.

Always, when practicable, the flues should be built in the wall, saving all the space in the building for use, leaving nothing to interfere with the placing of the belts or the machinery. The heat that might otherwise be wasted is thus absorbed by the walls and is not lost, as is the case where the flues are built outside the building. Flues built in this manner save all expense for piping and may be so arranged that each floor has flues of its own, or each flue may have openings upon each floor, and the temperature be regulated by the use of dampers, so arranged that every apartment is independent of every other apartment.

In mills for the manufacture of textile fabrics, trouble is always experienced because of the presence of electricity, generated by the motion of the stock and the machinery, which is a source of great annoyance and of positive loss. Practical experience has shown that nothing will remove this difficulty but the control of the humidity of the atmosphere, and this is done absolutely by the Smith Hot-Blast Apparatus, in connection with sprays and other convenient means.

It is impossible within small limits to describe or demonstate the benefits arising from the application of the Smith Hot-Blast System to the heating and ventilating of public buildings, such as theatres, churches, schools, and office-buildings, including stores of all kinds, that are not only filled with an army of clerks, but with another army of purchasers who are hurrying to and fro.

The quantity of air necessary to dilute the impurities in the atmosphere of a well-filled theatre amounts to between twenty-five and forty thousand cubic feet each minute; which is within the supplying capacity of an apparatus of very ordinary size, and the principal theatres of the country are now being heated by this system, some of them being furnished with at least sixty thousand feet of air each minute. As the pure, filtered air flows into the room, the foul air is forced out, either with the aid of exhaust fans, or by the pressure of the incoming air through well-arranged ventilators in proper position around the base of the room.

In buildings of this character a system of double air-ducts is so arranged that air of any temperature may be admitted to the room, while the desired supply is in no way interfered with. This is accomplished by the use of the automatic switch in connection with a cold-air chamber. By an automatic arrangement this mechanism is controlled so that the temperature never varies more than four degrees, and the supply of air is always the same.

The use of this system does away with indirect steam coils at the base of the flues, centralizes the entire heating system in one bank of coils securely surrounded with a steel jacket, with only one place where leakage is possible, but with one set of valves all located at one point, where the system is controlled. The flues are placed inside the walls, and in the instance of brick partitions, which it is always well to follow, their cost is inappreciable. The air comes into the auditorium about eight feet from the floor without draught of any kind, is forced to the outer walls at this or a higher level and becoming slightly cooler, falls to the floor and escapes through the ventilators arranged for the purpose as nearly as possible beneath the point of entrance.

The air may be taken from above the roof through a brick stack, the action of the fan drawing it down and forcing it through the ducts, making a plenum condition. Within the auditorium the pressure is always outward, the air seeking to escape through the ventilators prepared for it and through every other opening, which effectually prevents the possibility of any inward leakage, or for the drawing-in of any vitiated air from water-closets, or similar sources, and if the windows are open, the draught being outward, there is no possibility of catching cold because of sitting near them.

The application of this system to school buildings is prolific of the very best results. It is much cheaper than any other system that will supply the same amount of heat and accomplish the same amount of ventilation. In connection with the automatic arrangement of the switch and the cold-air chamber, the temperature of any room will never vary more than four degrees, and the supply of air will always be in excess of thirty feet

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each minute to each pupil. The fact that the air can be taken from any desired place makes the system invaluable in all large cities where the air near the ground is always burdened with dust and poisons. Compared to any furnace system, the saving in the cost of the building is sometimes nearly as great as the cost of the plant.

For use in churches there is no system of heating and ventilating which bears any comparison to the Smith Hot-Blast System. As the building is frequently not used much during the week, it is apt to be very cold in the winter-time and under the system generally in use, when Sunday comes, is heated only in spots or not at all, and oftener than otherwise is filled with devitalized air, which is breathed over and over again before the services are finished. With the Smith Hot-Blast Apparatus everything is different. An hour or two before the time for the commencement of the services the fires are started, and by an arrangement of flues the air in the building is passed time and again over the hot coils and the church is warmed to the proper degree in a very short time. When the proper temperature is reached, the air is no more passed around in a circle but fresh air is brought in and the foul or used air is taken out through the system of ventilators arranged for the purpose. Fresh air, plenty of it, breathed but once and by but one person is the result. In the summer-time the operation is reversed, and instead of driving the fresh air over hot coils, it is driven over coils that are cooled with ice-water, and thus the temperature of the room is reduced to any desired degree. There are at no time any steam pipes to burst and spoil the carpets, there is no mechanism to get out of order; everything is located at one point and nothing elsewhere can freeze up and burst.

In asking for estimates for buildings of any kind, send plans of the same with a description of the boilers if they are already in place, giving a complete description of the material and manner of construction of the building, the number and the size of windows, the height of the ceilings, the temperature desired to be maintained, and the minimum of the out-door temperature in the winter.

THE HUYETT & SMITH MANUFACTURING CO.
DETROIT, MICH.

POTSDAM RED SANDSTONE.

OFFICE OF THE POTSDAM RED SANDSTONE CO.
POTSDAM, N. Y., December, 1893.

We have recently added to our facilities for cutting stone during the winter months. During these months of the year but little stone-cutting for building is in progress, and the best workmen can be obtained at a substantial reduction in wages. We have facilities for handling stone by power and can easily work one hundred and fifty men in thoroughly warmed and ventilated buildings.

While our aim is to furnish stone in the rough, yet we desire to impress upon the architectural profession that we are prepared to quote reasonable figures for cut stone, ready to set in the building, and delivered to any part of the country. Our estimate will cover setting if required.

In order that we may more thoroughly protect our product from unfair competition by soft stone, we have lately withdrawn from a number of quarrymen's associations in which our membership has prevented direct estimates from us for cut-stone work.

Drawings for estimate can be expressed at our expense. They will be carefully cared for, kept in a fire-proof safe, and if requested in the letter forwarding them, will be returned in twenty-four hours after their receipt.

Among the buildings, the stone for which has recently been furnished by us, with one or two exceptions ready to set in the building — the building in nearly every case being of solid stone, though in some, trimmings or ashlar facings only were used — are the following. Many of them are now in process of construction. A series of helio-chromes (colored photographs) by the Heliotype Co. of a number of these buildings will shortly be issued by us, examples of which we will send to architects on request. If more than one is wanted a nominal charge of twenty-five cents each will be made.

Residence of Hon. J. Stevens, Rome, N. Y. Archimedes Russell, Architect, Syracuse, N. Y.
Residence of the Medical Superintendent, New York State Hospital, Ogdensburg. Hon. Isaac G. Perry, New Capitol Commissioner, Architect, Albany, N. Y.
Residence of Francis Wilson, New Rochelle, N. Y. G. Kramer Thompson, Architect, New York City.
Residence of Gustave S. Dorwin, Ogdensburg, N. Y. William J. Akin, Architect, Albany, N. Y.
Residence of Herbert P. Bissell, Buffalo, N. Y. Charles D. Swan, Architect, Buffalo.
La Concha Building, Syracuse, N. Y. E. M. Buell, Architect, Syracuse.
Luburg Building, Philadelphia, Pa. J. F. Stuckert, Architect, Philadelphia.
Residence of S. D. Coykendall, Rondout, N. Y. Vaux & Radford, Architects, New York City.
Four Buildings for St. Lawrence State Hospital Ogdensburg, N. Y. Hon. I. G. Perry, Architect, Albany. (Three of solid Potsdam stone. Over seven thousand feet of water-table furnished by us for these buildings.)
Residence of William K. Pierce, Syracuse, N. Y. Henry W. Wilkinson, Architect, Syracuse.
Residence of Geo. W. Daw, Troy, N. Y. F. H. Janes, Albany, N. Y.
Florence Buildings, Syracuse, N. Y. Baxter, Buells & Taber, Architects, Syracuse.
Floore Building, Lexington, Kentucky. H. W. Aldenburg, Architect, Lexington.
Church at Oswego, N. Y. J. H. Seeber, Architect, Oswego.
Residence of F. H. Stevens, Buffalo, N. Y. Lansing & Beierl, Architects, Buffalo.
Residence of B. F. Spinney, Lynn, Mass. W. T. Sears, Architect, Boston.
Residence of Thomas S. McFarland, Buffalo, N. Y. Chas. D. Swan, Architect, Buffalo.
Church at Greenbush, N. Y. Edward W. Loth, Architect, Troy, N. Y.
Receiving Vault, New Bedford, Mass. S. C. Hunt, Architect, New Bedford.
Residence of David H. Desbecker, Buffalo, N. Y. Charles D. Swan, Architect, Buffalo.
Free Press Building, Brooklyn, N. Y. T. Englehart, Architect, Brooklyn.
Residence of Walter H. Johnson, Buffalo, N. Y. F. H. Loverin, Architect, Buffalo.
Hospital Building, Pittston, Pa. John T. Windrim, Architect, Philadelphia.
Residence of Geo. L. Lewis, Buffalo, N. Y. Chas. D. Swan, Architect, Buffalo.
Summer residence of Charles G. Emery, Clayton, Thousand Islands. J. W. Griffin, Architect, Watertown, N. Y.
Residence of Edward L. Anthony, Buffalo, N. Y. Chas. D. Swan, Architect, Buffalo.
Residence of Alexander T. Brown, Syracuse, N. Y. G. A. Wright, Architect, Syracuse.
Office Building for Hiram Walker, Sons & Co., near Detroit, Mich. Mason & Rice, Architects, Detroit.
Residence of J. H. Kobusch, St. Louis, Mo. Charles F. May, Architect, St. Louis.

Note. — The Ottman Lithographing Co., lithographers for *Puck*, have in preparation for us a calendar for the coming year. It will be 22 by 28 inches in size, and in a number of colors and in the highest style of the art for which the Ottman Company are so famous. Competent judges are unreserved in its praise.

We shall be glad to forward the reader a copy free of express-charges if requested, as soon as the edition is completed.

Address,

THE POTSDAM RED SANDSTONE CO.,
POTSDAM, N. Y.

NOTES.

A catalogue, which at the same time commemorates the ending of a century of successful business career, has been received from Messrs. Harrison Bros. & Co., manufacturers of paints and chemicals, Philadelphia. This is a ninety-page book, which might more fittingly be termed a dealer's manual of information on paints and pigments, since opposite every page of price-list are copious notes, giving valuable information as to the use of the different paint materials, and indicating clearly to the dealer just what should be offered for any particular purpose of the painter. It contains, moreover, much information which would be of great value to architects and engineers, to whom, doubtless, a copy would be sent upon application. The book is handsomely printed on highly calendered paper, with running head-lines in red, in a design into which the trade-mark of the firm is ingeniously introduced. The illustrations, which are numerous, are half-tones from photographs, showing clearly, without exaggeration, the wonderful facilities possessed by this extensive establishment, which comprises almost a village within the fences which form its boundary. An interesting feature is a complete list of popular color-names, which properly belong to the various paints of their well-known "Town and Country" brand; this is useful in combination with a set of sample-cards of these paints in pointing out to a client the exact color indicated by any particular name, and as it is followed up by suggestions for harmonious and pleasing combinations, it should prove a valuable ally in laying out any decorative scheme on any special line suggested.

We hereby announce that we now have in press, and will issue early in January, a catalogue of the products of our new cabinet lock department, which now includes a complete line of cabinet locks of every kind, size and style heretofore regularly called for by the trade, as well as a number of new and special goods. This catalogue will be not only the latest but, we believe, the best, relating to this line of products which has ever been published, and will especially commend itself to dealers and users of such locks by reason of its many advantages and conveniences. Simultaneously with its distribution we will be prepared to furnish customers with price books containing our latest quotations. In view of the early issue of the catalogue, and of the completeness of the line which it embraces, we trust that our customers will defer placing orders for cabinet locks for the coming season until the new book has reached them and been examined. We venture to predict for it the same approval which has so cordially been given to our trade-catalogues of other products recently issued.

THE YALE & TOWNE MANUFACTURING CO.

N. & G. Taylor Co., Philadelphia, manufacturers of tinplate, have just sold a lot of their roofing-tin to the Harvey Steel Car & Repair Works of Chicago. This firm has secured the contract for altering about two hundred of the Illinois Central Railroad cars that were in use during the World's Fair. Everyone will remember these cars that took the visitor from the Auditorium to the Fair grounds in fifteen minutes. Messrs. N. & G. Taylor Co., report that the demand for their brand of Taylor "Old Style" is simply enormous and constantly increasing. This brand is the heaviest coated roofing tin made.

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ALSEN'S PORTLAND CEMENT.

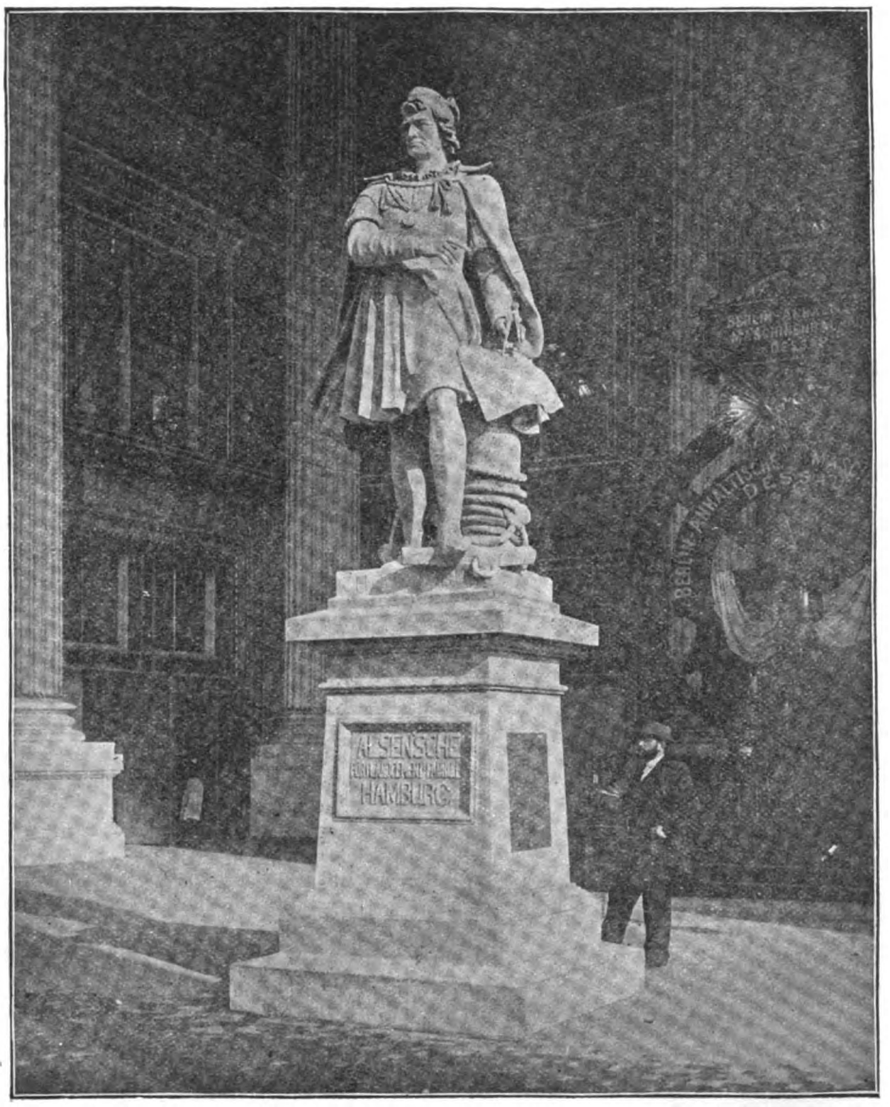
AMONG the exhibits of cement manufacturers at the Chicago Exhibition, one of the most noticeable was that of the Alsen's Portland Cement Works of Hamburg, Germany. This exhibit shows conclusively the great advancement which has taken place in this industry, and the new and important uses to which Portland cement may be applied. Among the latter is the adornment of the outside and inside of buildings.

The Alsen's Portland Cement Company exhibit two statues made of their cement, one of which, the statue of Columbus, by reason of its intrinsic merit and beauty, was given the prominent position at the main entrance of Machinery Hall. A cut of this statue is here shown. The sculptor is Mr. Engelbert Peiffer, of Hamburg, Ger., and it was originally designed for the City of Hamburg, where it was to be cast in bronze and erected in that city last year in commemoration of the discovery of America. The epidemic of cholera interfered with this, however, and the Alsen's Cement Company secured the model and had it cast in their cement as part of their exhibit. Another statue exhibited by this company stood at the entrance of the Alsen Pavilion, and is beautiful in design and execution. It is the work of Mr. Wilhelm Goetze, also of Hamburg. It is larger than the Columbus statue.

These statues have been donated to the Park Department of Chicago, and they will hereafter stand in Garfield Park.

The Alsen's exhibit include a number of gargoyles, representing grotesque heads and intended for the outside decoration of buildings. The execution of these statues and castings is of the highest order. They are of an even uniform color, without crack or blemish, and have the appearance of fine sculptures. The extreme fineness and regularity of this cement renders it well adapted for this class of work or for the stuccoing of the outside of buildings, which latter is becoming a desirable mode of building among architects both in Europe and America. In this connection it may be mentioned that the outside of the German Government Building at the Chicago Exhibition was stuccoed with Portland cement purchased by the German Government of the Alsen's Cement Works.

Other exhibits of the Alsen's Company include drain and sewer pipes of large dimensions, tanks and vats for dye and chemical works, which are very hard and quite impervious to water. Most of the sidewalks of Chicago, as well as other western cities, are being made of Portland cement which, when done by a conscientious workman, has no superior, both for durability and beauty. The Alsen's cement is largely used for this purpose, and there are no finer sidewalks in the country than those made of this brand. Among the recent uses which this cement has been put to is its employment in the concrete pneumatic foundations for the new Manhattan Life Insurance Company Building on Broadway, N. Y. This is to be the heaviest and tallest structure in New York, and it is probably the first building to be erected on foundations of this character. Caissons were sunk seventy feet below the surface, Alsen's cement being used exclusively by Messrs. Sooysmith & Co., the engineers who put in the foundations.



Statue made of Alsen's Cement in Front of the Machinery Building, World's Fair, Chicago, Ill.

Alsen's Cement Co. has received both a medal and diploma for their exhibit at Chicago.

ALSEN'S PORTLAND CEMENT CO.
HAMBURG, GERMANY.

A MEDAL FOR THE GORTON BOILER.

MESSRS. Gorton & Lidgerwood Company, 96 Liberty Street, New York City, sole manufacturers of the Gorton steam-heating boiler, have received the official ribbon of award from the Jury of Awards at the recent Columbian Exposition, which precedes the presentation of the award itself. The examination of this class of exhibits was, we understand, undertaken by a jury exceptionally well qualified to extend an opinion worthy of general acceptance. Under such circumstances the award to the Gorton boiler, claims for this widely known system of warming dwellings and other structures the attention and investigation of persons desiring the most economical, healthful and satisfactory heating service. The year just closed has been a busy one with the Messrs. Gorton & Lidgerwood Company, their business showing a large increase over that of last year despite the prevailing quietness of trade observed in almost all lines of manufacture.

JENKINS Brothers of New York will remove their Philadelphia office to 117 North Fourth Street.

BUILDING INTELLIGENCE.

Reported for the American Architect & Building News.

HOUSES.

New York, N. Y.— *One Hundred and Eighty-fifth St.*, n s, 216′ w Amsterdam Ave., 2 three-st'y stone and frame dwells., tin roofs; cost, $3,000; owner, Andrew Nilson, 201 East Fifty-sixth St.; architect, Carl Arenander, 379-381 Willis Ave.

Tremont St., s e cor. Washington Ave., 5 three-st'y brick and frame dwells., tin roofs; cost, $16,000; owner, George W. Hoger, Coney Island; architect, J. J. Vreeland, 711½ Tremont Ave.

One Hundred and Sixty-ninth St., three-st'y stone and frame dwell., tin roof; cost, $3,500; owner, Gustave P. Muller, 1056 Tiffany Ave.; architect, Alex. Fowler, 701 East One Hundred and Thirty fifth St.

Decatur Ave., e s, n Isaac St., three-st'y brick and frame dwell. slate roof; cost, $3,500; owner, Henry D. Penroy, Webster Ave. and Cole St.; architect, A. Arctander, 561 East One Hundred and Thirty-ninth St.

Eighty-ninth St., s s, 100′ e West End Ave., 3 four-st'y brick dwells.; cost, $54,000; owner, T. A. Squier, 314 West One Hundred and Fourth St.; architect, Clarence True, 102 West Eighty-first St.

Seventy-eighth St., n s, 100′ w West End Ave., 12 four-st'y brick dwells., tin roofs; cost, $180,000; owners, John and David Dunne, 323 West Eighty-fifth St.; architect, G. Fred Pelham, 1481 Broadway.

Seventy-fifth St., n s, 100′ e Amsterdam Ave., 5 four-st'y brick dwells., tin roofs; cost, $125,000; owner, Fred Aldhouse, 513 Lenox Ave.; architect, John C. Burne, 101 West Forty-second St.

West One Hundred and Eighty-second St., Nos. 506-510, 3 three-st'y brick and frame dwells.; cost, $13,500; owner, Julius C. Morgenthau, 54 West Seventy-fifth St.; architect, J. Averit Webster, 219 West One Hundred and Twenty-fifth St.

One Hundred and Fifty-second St., s s, 80′ w Morris Ave., four-st'y brick dwell., tin roof; cost, $13,000; owner, John Ellard, Fifth Ave., bet. Ninety-ninth and One Hundredth Sts.; architect, M. J. Garvin, 3311 Third Ave.

Fox St., w s, 329′ s One Hundred and Sixty-seventh St., 3 three-st'y brick and frame dwells., tin roofs; cost, $11,100; owner, George Spaith, 443 Pleasant Ave.; architect, John De Hart, Fox St., near One Hundred and Sixty-fifth St.

One Hundred and Sixty-fourth St., s s, 125′ e Morris Ave., three-st'y stone and frame dwell., tin roof; cost, $4,000; owner, Richard H. Moran, 29 Gouverneur St.; architect, B. F. Frisbie, 721 East One Hundred and Sixty-fourth St.

Webster Ave., w s, 14′ n One Hundred and Seventieth St., 3 three-st'y stone and frame dwells., tin roof; cost, $15,000; owner, Bernard Schmalacker, Washington Ave., n One Hundred and Sixty-ninth St.; architect, M. Ganvin, 3311 Third Ave.

Hoe Ave., e s, 225′ n One Hundred and Sixty-seventh St., three-st'y brick and frame dwell., tin roof; cost, $3,500. owner, Joseph Lieberts, 1020 Prospect Ave; architect, F. J. Miller & Co., 727 East One Hundred and Sixty-third St.

One Hundred and Sixty-seventh St., n s, 75′ e Hoe Ave., three-st'y brick and frame dwell., tin roof; cost, $3,500; owner Joseph Lieberts, 1020 Prospect Ave.; architect, F. J. Miller & Co., 727 East One Hundred and Sixty-third St.

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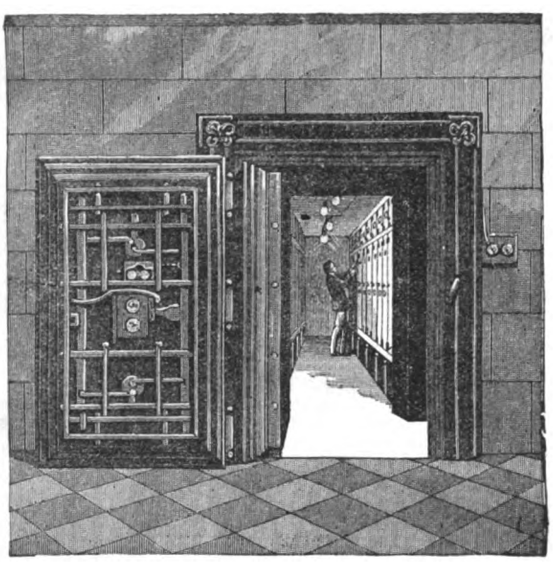
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it is sometimes desirable to put these double rather than single, to avoid any possible warping of the styles; where, however, mortices and tenons cannot be employed, handrail screws may frequently be used with advantage. Dovetails are also very good, but apply more especially to sashes and cabinet-making. Wall-panellings, dados and skirtings should always be tongued together at the angles and into the floor, otherwise dust will find its way between and underneath them, possibly forming a harbor for the germs of infectious disease. Flooring should be laid in narrow widths and tongued at the joints; the system now illustrated is an excellent one, and gives every opportunity for good secret nailing. Large columns will never stand if made solid, but will crack and twist out of all shape; if, however, they are made in sections, the difficulty is entirely avoided, the result being very much better work at no increase of cost, but rather the reverse. When great strength is required, such as an open-timber roof, solid wood must, of course, be used.

The various systems of mitreing next claim attention. In cheap joinery the work is framed up square, and the mouldings mitred in afterwards on the top of the panels; but this method is open to serious objection, the stability of the mouldings depending entirely on nails driven in at an awkward angle, and if these chance to go through the panels instead of into the styles and rails, and the panels shrink, the result will be an unsightly crack; except in the case of bolection mouldings, which can be rebated onto the styles, etc., and properly fastened. This treatment should never be adopted for good work. An infinitely better system, and the one usually employed in high-class joinery, is to work the mouldings on the solid of the styles, rails, etc., cutting out the styles to receive the rails, and so forming a mitre. A third method, applied more especially to ecclesiastical joinery, will be referred to later on.

When the work is ready for framing up, it is most desirable to put it together and let it stand as long as possible before actually gluing and wedging, as no matter how dry the wood may be it is sure to shrink when first worked; in fact, there are well authenticated instances of this occurring when re-working old beams which have been in position for 200 or 300 years. Framing up and cleaning off afterwards are two very important matters; shoulders, which in soft woods need hardly be touched after leaving the machine, must, in hard woods, be gone over carefully by hand, otherwise good results cannot be obtained. Mitres, too, demand very special attention; for all such work the tools differ very materially from those used for soft woods, the most effective having either metal faces or being entirely of metal; in finishing off these tools are also of the greatest assistance, as glass-paper should on no account be used. A few tools are shown illustrating those formerly in use and those of the present day.

When the more elaborate and intricate forms of ecclesiastical joinery are entered upon the greatest demands are made on the skill of the workman; ancient work was, of course, all done by hand, and still fills us with admiration for its beauty, variety and general excellence. Evidently in those days, time was only a secondary consideration, and nothing was spared to make the work worthy of the high purpose for which it was intended.

> In the elder days of Art,
> Builders wrought with greatest care
> Each minute and unseen part;
> For the Gods see everywhere.

Unfortunately, at the present day, time is of so much importance that it is very difficult to devote the same amount of it to any particular work as the old men did; but there is ample proof, even now, that when cost is not the first consideration, work of high quality can still be produced.

Vaulted canopies require much care. These, if of any size, should be built up; if worked in the solid they will crack and twist, utterly spoiling the effect, and in addition be much more expensive; but if the ribs are worked singly to the required sweep and section, rebated for the spandrels, then mitred together, the spandrels filled-in afterwards and the whole covered at the back with strong canvas well glued, they will stand. Very small and specially elaborate canopies, such as the one shown, must, of, course, be cut out of the solid to a great extent.

The third system of mitreing already referred to (known as mason's mitres) now claims attention. It consists in working the returns of the mouldings in the solid of the styles, to stop those on the rails and on the rails and sills, to stop the mullions. The actual working of these returns is done after the work is glued up. It is of necessity a more costly method than the others, but there can be no doubt that in such work as that before you (which will show the system clearly) it is the only proper way, and far stronger than any other.

Much old panelling was filled with linen-fold panels, which always look well, and several good ancient examples are before you. These, however, seem to have fallen into disuse, which is to be regretted, more especially as they are really inexpensive, considering the good effect produced, the play of light and shade being very pleasing.

In tracery great opportunities occur, but it is only when cut by hand that all its beauty is brought out, and endless variety can then be obtained. When, however, cost is of supreme importance, the aid of machinery can be called in, and by its use the mouldings worked, leaving only the angles and pockets to be done by hand, and if the cusp points are simply turned out the cost will be still further reduced. In sunk tracery the various sinkings can also be done by machinery; the least expensive section consists of a hollow, a second member, more especially if it is a bead, considerably increasing the labor.

How to treat the face of hardwood joinery frequently requires much consideration and deserves a passing notice. In the case of oak, the action of the atmosphere would tone it down admirably; but this takes time, and the first appearance of newness is often removed by the fumes of ammonia, which can be regulated to produce any desired shade, and the treatment is a good one when the work is not subject to much handling; where it is, however, beeswax and turpentine are generally applied afterwards, as otherwise the damp heat of the hands will leave dark marks; care must, however, be taken that as much of the wax is rubbed off as possible or the work will very probably turn yellow in time. After this application the oak will cease to darken, as the wax fills up the pores and prevents any further action of the air. Beeswax and turpentine alone also produce good results on most hard woods when well rubbed in and a very pleasant surface is the result, much the same as the slight polish seen on an egg-shell. This treatment is also particularly useful for floors. These, however, require periodical attention. Simple oiling is never satisfactory. French polishing is a very general treatment, but is too well known to need any description.

It is of the most vital consequence to remember that damp plays havoc with seasoned woodwork, causing it to swell and warp. It is, therefore, fatal to put it against damp walls; when it is impossible for these to have time to dry, the wood should be well coated at the the back with a damp-resisting preparation and not be fixed close against the wall.

Hardwood joinery is a dry subject — in fact, so essentially a dry one and affords so little opportunity for making a paper on it attractive, that it is much to be feared the present one has caught the infection and become in its turn thoroughly dry; still hardwood joinery is a matter which deserves some attention, and possibly the facts placed before you may induce a further study of the methods of working, which will certainly prove useful.

The introduction of machinery, although materially reducing the cost of production, has not by any means done away with the necessity for skilled workmen; skill, however, can only come by practice following long and careful training, and in some respects the two essentials requisite for thorough work, good workmen and good materials, bear a strong analogy in the careful preparation both require. The forest may contain the finest trees, but unless these are properly converted and allowed to season, much of their value is lost; and a youth may have all the natural qualifications necessary to make a good workman, but without proper training is never likely to reach a high standard of excellence; both the seasoning of the wood and the training of the youth require time — time which may seem at first sight wasted, but is really fitting each to become of real use. It must be a matter of regret to all who have the true interest of the British working-man at heart, that the system of apprenticeship has almost died out. No doubt it entailed much drudgery (this must, however, be encountered in all callings earnestly pursued), but it gave a man a better insight into his trade and a more thorough mastery of all its details than can possibly be obtained by any other means.

Really good men are as much in demand as ever they were, and the more care and attention a man bestows on his work and the greater the skill he brings to bear upon it, the more likely will he be to insure what every good workman desires, constant employment; and beyond this he will have the satisfaction of knowing that he is doing good work — a satisfaction dear to every earnest and honest worker, be he artist or artisan.

Mr. Owen Fleming proposed a vote of thanks to Mr. Barnes, and said he listened to the paper with great attention and interest, as he was sure all present had likewise done. Mr. Fleming then put various questions to Mr. Barnes.

Mr. C. Hindley seconded the vote of thanks, and drew attention to what he called the artificial dodges of joinery. For one thing, joints in cabinet should be avoided — as in chimneypieces and similar kinds of joinery. Mouldings should be screwed on from behind. In regard to door-panelling, he described on the blackboard the best mode of cutting tenons. He also alluded to the best way of using glue where it had to be used. Scotch glue, according to tests, was better than French glue, but the two combined were very good.

Mr. Beale mentioned a newel by Messrs. George Smith & Co., of Grosvenor Square, built up of forty or fifty pieces of wood, but looking to the amateur eye like one piece, and he asked Mr. Barnes what would be the fate of it in a few years as compared with solid oak. In his opinion solid oak was far ahead of built-up work.

Mr. W. S. Weatherley said he thought solid work had died a natural death. In Sir G. Scott's office solid oak was always specified, but it used to crack afterwards. He advised young architects to visit workshops.

Mr. Max Clarke thought more good could be got by inspection and study in country workshops than in the London workshops.

The President said that Mr. Barnes must be complimented on the large audience he had drawn together. It was not any question of cost that influenced the use of oak in small pieces, but the reason was that in small pieces it lasted so much longer. With pine backing it would stand for centuries. The Mediævalists would not use

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solid oak, as their experience was it would not last. The old Georgian examples were not in the solid. Trades-unionism looked only to wages, without having any interest in the quality of work turned out. He would not allude to putty, which formed about ten per cent of framework joinery; the makers said an extra coat of paint would put it right. In the case of a pulpit, fumigation had deadened the grain if not taken it out. Mr. Barnes said that was because it had not been sufficiently fumigated. As to oak, builders did not appear to agree which was the best.

The vote was then put and carried by acclamation.

Mr. Barnes, in reply, said he hoped his paper would do good if it only called attention to the possibilities of designing in hardwood and for use of machinery. Scotch glue was stronger than French, but in using glue you must squeeze every particle out again as far as possible. The Austrian — or more properly the Hungarian — oak that comes from the Slav forest was somewhat open in grain, but he considered it the best oak that could be supplied, now the Riga supply was exhausted. The inferiority of Trieste oak perhaps accounted for the bad reputation of Austrian oak among builders.

PROTECTION OF CONSTRUCTIVE IRONWORK.[1]

IN many instances constructive ironwork is exposed to corrosive influences of so exceedingly injurious a character as to render all attempts at preventing its action hopeless; but in every case it is possible to arrest and to restrict the evil within certain remediable limits — or in plain language, not to allow it to go too far. There are a large number of excellent preservative paints for every description of ironwork in the market, which have given proofs of their durability and efficiency, both at home and abroad. But it is too much to expect that a single application of two or, at the most, three coats is to preserve ironwork from rust for an indefinite period. The manufacturers themselves could not guarantee their goods to be absolutely imperishable. Even in interior work, which is never exposed, or, at any rate in a comparatively slight degree, to climatic influences, it is necessary to renew at certain regular intervals the protective coats of paint or varnish. Clearly this necessity must become *à fortiori* accentuated when it concerns the preservation of work which is exposed, according to its locality, to the gradually destructive effects of every climate in the world. It has alike to withstand the heat of the Tropics and the cold of the Arctic regions. The greatest aid to, or friend of, the corrosion of ironwork under all circumstances is neglect. It is positively amazing to reflect upon the fact that, while hundreds of thousands of pounds are cheerfully spent upon the erection and construction of large examples of ironwork, a thousand or two are grudged for their proper maintenance and preservation. It is often easier to obtain a large sum to build a new bridge or ship from the "board" than it is to raise the comparative trifle necessary to properly scrape and repaint an old one.

There are not wanting examples of ironwork which, when properly protected, have withstood for very long periods the deteriorating action of external atmospheric influences. When, about seven years ago, the enlargement of the Westland-row Railway terminus in Dublin was carried out, the old original iron roof over the station existing in 1846 was found to be in such excellent preservation, that the principals were utilized, with some slight alterations, for the roof, the court-yard entrance on the north side of the new station of the walls of the court-yard having been built to the proper width to suit. The old principals carry Braby's patent glazing of ¼ inch rough rolled plate-glass in zinc and timber. It is not, however, so much of iron structures above ground, the preservation of which is a mere question of care, proper inspection and cost, that we are now treating of, as of those parts of the same structures which are located underground. If they could be so thoroughly protected as to be altogether exempt from the action of water, air, or other agents which combine to set up an acid reaction, there would be not much to fear from corrosion; but such an immunity is practically an impossibility. Dry air and pure water act but very feebly as oxidizing elements upon ironwork; but when the former becomes moist, and the latter impure and acidulated, oxidation of the material is very speedily set up, and when once commenced, its ultimate destruction, unless the process is arrested, is a simple question of time.

The effect of lime, whether as one of the ingredients of mortar, cement, concrete, or of limestone, as a corrosive agent of ironwork, appears to depend very much upon the conditions of each particular case. A mixture of coal-tar and slacked lime was applied to the wrought-iron flooring of the tubes of the Britannia Bridge, with marked success, and this combination has been frequently used in foundation work. It has been found in examining the wire cables of some of the American suspension-bridges, that where portions of the limestone used in the foundation of the bridges have, by some chance or other, come into permanent contact with the strands, some of the latter have been completely eaten away. The presence of water was no doubt essential to this corrosive action, but it is a very difficult matter to build masonry so that it will not allow of some moisture permeating it. This difficulty becomes greatly increased when the parts of the ironwork inclosed or surrounded by masonry are subject to motion, no matter how slight it may be. The anchoring lengths of the cables or chains of suspension-bridges are all subjected to a slight see-saw or rocking motion, which must gradually affect the concrete and masonry surrounding them, so as to render them slightly porous, and thus allow of the passage of water. Movement of this description is not confined solely to the anchorages of suspension chains. There is no doubt that the bases of all columns and pillars set in concrete, or upon blocks of masonry or brickwork, are affected in the same manner. As a protection for ironwork when exposed to subterranean or submarine influences, cement-mortar appears to afford satisfactory results. It has been found to act very beneficially in protecting the inside skin of a ship against the oxidation caused by bilge-water. In whatever instances it may be employed, the contact between it and the plates it is designed to protect must be maintained intact. Any percolation of water through cracks and fissures would be as fatal to its preservative powers as if sulphur gases were present. Where the mortar has been preserved in a perfectly hard, compact, and dry condition, links of the anchoring-down chains of suspension-bridges have been taken up in a perfect state of preservation without the least appearance of rust. In some instances the ironwork imbedded in the cement-mortar was painted before being so fixed, and upon the paint being chipped off appeared perfectly bright and clean beneath. As the extra expense would in all cases be trifling, it would be as well to make assurance doubly sure, and paint all constructive ironwork with coal-tar or two good coats of iron-paint before setting it underground or below water in either cement-mortar or masonry or brickwork.

[1] Paper by Thomas B. Grierson, M. Inst. C. E. I., A. M. Inst. C. E., and read before the Institution of Civil Engineers of Ireland, April 5, 1893.

BOOKS AND PAPERS.

W. M. Patton's treatise on foundations[2] has been noticed indirectly in this journal quite extensively in recent issues in connection with the discussion which has been raised as to the quality of the English cements. The book itself starts out with the very engaging statement that the author, having been a professor for over six years, fully realized the need of suitable books by which to temper the almost painfully scientific, abstruse and purely theoretical books which he was compelled to put into the hands of students in engineering. A perusal of the table of contents also suggests great possibilities in the work itself, but when the subject-matter is reached there is so much that is unnecessary, so much added that has no special reference to the subject whatever, and notwithstanding the prefatory reference to painfully abstruse books, there is so much complication about the attempt at arithmetical solution of so simple a subject even as the strength of a retaining-wall, that the value of the book for reference and for study by practical students is hardly what it might be. The work is too complete. If it were restricted entirely to foundations as such, and the chapters upon Building-stones, Quarrying, Stereotomy, String-courses and Copings, Ice and Wind Pressure, Arches and Skew-arches had been entirely omitted, the work would then have been more likely to answer the needs which the preface seems to suggest. The fact is, the matter of foundations is not a complicated subject. It is too fundamental to admit of abstruseness or a purely theoretical treatment, and while there is a mass of valuable information scattered through the book which every student ought to possess and which every practical man needs to have at his command, the real merit of the work as a whole could be vastly improved by a judicious course of pruning.

Good text-books on descriptive geometry and on its various practical applications are sadly wanting in the English language. American teachers of these branches have been particularly backward in giving to the public in permanent form the substance of their lectures and class-room instruction. Architectural students outside of the large technical schools have been not a little hampered by this dearth of text-books, especially in stereotomy and sciography. With the development among us of a more academic and serious style of architectural rendering than formerly prevailed, the calls for concise and practical treatises on shades and shadows are constantly multiplying, and Mr. Wm. H. Lawrence, instructor in the Massachusetts Institute of Technology, has set a good example in taking the first step to supply this demand. His "*Elements of Shades and Shadows*"[3] is hardly more than a first step, though an excellent one and in the right direction. With its twenty-four pages of text, its twenty-one problems and its thirty-seven figures it is so modest and unpretending in size, style and form, as almost to disarm the obvious criticism it calls forth, that it is an incomplete work. It is more like the first section of a text-book on the subject than a text-book itself, and might, perhaps, have been more properly entitled "Selected Problems in Shades and Shadows." It is not quite clear what was the author's programme and why he stopped where he did; there is no preface nor introduction to explain it. There is a first chapter of definitions, with one problem (the shadow

[2] "*A Practical Treatise on Foundations*," by W. M. Patton, C. E. New York: John Wiley & Sons.

[3] "*Elements of Shades and Shadows for Architectural Students*." Prepared by Wm. H. Lawrence, Instructor in Architecture, Massachusetts Institute of Technology. Boston: Press of H. G. Collins, 15 Milton Place, 1893. Small 8vo, pp. 24, 9 plates.

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of a point), and a series of elementary propositions, all compressed into four and a half pages. Then follow twenty more problems in three chapters, which treat respectively of polyhedrons, of cylinders and cones, and of double-curved surfaces of revolution — the sphere, torus and scotia; with a concluding problem on the shadows of a pediment. There is no attempt to analyze or classify the different methods and processes employed, or to lay down general principles of procedure from which the special applications are derived and developed. With the exception of the shadow of a chimney on a roof, of a line on a flight of steps, and of the pediment, the application of the elementary geometrical problems to architectural forms is not even alluded to. There are none of those special solutions for particular cases, or of those delightful "short-cut" processes, which sometimes so greatly simplify the draughtsman's task. Nor is there any discussion of shadows cast by objects on other surfaces than their own or those of the coördinate planes. These things one would expect to find in a text-book for architectural students, and their absence justifies the verdict already suggested, that the book is an incomplete work. Its programme is *too* modest and restricted, to the serious detriment of its usefulness.

Taking it, however, for what it is, rather than for what one would wish to see it developed into, its quality is excellent. The treatment of the problems is remarkably straightforward and direct. Its brevity and conciseness of statement, its simplicity of language, short sentences and clearness of expression, are all admirable, and the nomenclature and in general the notation, sensible and logical. The book is well-made and opens flat; the figures are clearly presented and legibly lettered, and the plates are so printed on long, folded slips that each can be opened out wholly beyond the edge of the book, permitting ready reference to any figure from any page of the text without turning over the leaf. This displays a very rare and delightful consideration for the reader's comfort and convenience. It is a pity that this painstaking little book stops where it does. If the author will expand his scheme to cover more ground and cover it more completely, the resulting book would certainly fill a long-felt want. As it is, students under competent instructors and such as are quite familiar with the conceptions of descriptive geometry, and can extend into their practice the applications of its problems, will find it helpful and suggestive.

SOCIETIES

ENGINEERING ASSOCIATION OF THE SOUTH.

THE Engineering Association of the South met at Nashville, Tenn., December 14, with a fair attendance. Messrs. Jno. M. Picton, George F. Blackie and Charles E. Bowron were elected to membership. The following officers have been elected for the next year: *President*, Charles Hermany, Louisville, Ky.; *First Vice-President*, W. C. Smith, Nashville, Tenn.; *Second Vice-President*, J. Kruttschnitt, Houston, Texas; *Secretary*, Hunter McDonald, Nashville, Tenn.; *Treasurer*, W. T. Magruder, Nashville, Tenn.; *Directors* from Tennessee, W. W. Carson, Knoxville, W. L. Dudley, Nashville and E. C. Lewis, Nashville; *Director* from Kentucky, Jno. B. Atkinson, Earlington; *Director* from Georgia, George H. Crafts, Atlanta.

Mr. G. D. Hicks, Div. Superintendent, Nashville, Chattanooga & St. Louis Railway, presented a paper on the Hobbs Island Transfer, from which the following is condensed: Hobbs Island and Guntersville, Ala., are 20 miles apart, on opposite banks of the Tennessee River, and on one of the lines of the N. C. & St. L. Ry. This gap is closed by the Hobbs Island Transfer. The transfer plant consists of two stern-wheel steamboats, of 40 and 90 tons burden, and two double-track barges, one for four and the other for six cars; the lighter boat conveys the passengers and the other, with the barges, the freight. Time between Hobbs Island and Guntersville, two hours for the passenger-boat and two and one-half hours for the freight.

At each of the termini is an incline, at the foot of which is a cradle movable along the incline, so the cars can be run upon the barges at all stages of the water. The river has a rise and fall of 40 feet at Hobbs Island and 47 feet at Guntersville. The inclines are on $3\frac{1}{2}$ grade, on earth fill, pile trestle, rip-rap bank, and at the bottom a crib, where the nature of the river-bed prevented driving piles. The incline at Guntersville is, in part, on a 10-degree curve. The cribs are built of 12″ x 12″ timbers, layers of 12-foot lengths (8-foot centres) crossing layers of 25-foot lengths (3-foot centres), all drift-bolted. These cribs were loaded with stone, then capped by 12″ x 12″ stringers, laid to grade and bearing the 8″ x 9″ — 19-foot ties, dowelled to the rails and the 5″ x 9″ guard-rails.

The cradle at Guntersville is novel, in that it is constructed to move on a 10-degree curve, as well as on a tangent. It consists of eight sections on wheels and two on slides, each about 16 feet long, the first section carrying a 20-foot apron and the last a feather-rail. The sections are not rigidly connected, but by a bolt allowing about 5 inches play. The rails are laid with opposite joints spiked only at the joints, and held together by tie-bars. The rails outside on the curves are $1\frac{3}{4}$ inches longer than those on the inside; on tangent the openings thus formed between the shorter rails are each filled by a short section of rail inserted and held by a split key passing through its web and the splice-plates. The bolt-holes in the rails are slotted. The cradles are moved along the incline by a locomotive or a steamboat.

The connection between the apron and the barge is unusual. The ends of the rails on the apron are turned outward at about 30 degrees at the junction, while the rails on the barge are at the end bevelled at the same angle. The latter are held together by five tie-rods, the one nearest the bevelled ends having a turnbuckle. Just back of this rod, a lever is arranged to lift the bevelled rails clear of the apron, till the windlass has drawn the nose on the barge into the V on the apron, the gauge having been lessened by the turnbuckle. Then the bevelled rails are lowered into place and the gauge restored by the turnbuckle, making the rails continuous from the barge to the cradle. The cost of the steamboat and barges was $30,368, that of the crib and cradle at Hobbs Island, $4,343 and $837 respectively, and at Guntersville $3,045 and $961 respectively.

The association will meet again January 9.

HUNTER MCDONALD, *Secretary.*

FRANKLIN INSTITUTE, PHILADELPHIA, PA. — REWARDS FOR MERITORIOUS DISCOVERIES AND INVENTIONS.

THE attention of ingenious men and women is hereby directed to the fact that the Franklin Institute of the State of Pennsylvania for the Promotion of Mechanic Arts may grant, or recommend the grant of, certain medals for meritorious discoveries and inventions which contribute to the promotion of the arts and manufactures.

The character and conditions of these awards are briefly stated in the following:

The Elliott Cresson Medal, founded in 1848 by the gift of the late Elliott Cresson. The medal is of gold, and by the terms of the deed of trust may be granted for some discovery in the arts and sciences, or for the invention or improvement of some useful machine, or for some new process, or combination of materials in manufactures, or for ingenuity, skill or perfection in workmanship.

The John Scott Legacy Premium and Medal (twenty dollars and a medal of bronze), awarded by the City of Philadelphia. This medal was founded in 1816 by John Scott, a merchant of Edinburgh, Scotland, who bequeathed to the City of Philadelphia a considerable sum of money, the interest of which should be devoted to rewarding ingenious men and women who make useful inventions. The premium is not to exceed twenty dollars, and the medal is to be of copper, and inscribed "To the most deserving."

The control of the Scott Legacy Premium and Medal (by Act of the Ordinance of Councils in 1869) passed to the Board of Directors of City Trusts, and has been referred by the Board to its Committee on Minor Trusts, and that Committee has resolved that it will receive favorably the name of any person whom the Franklin Institute may from time to time report to the Committee of Minor Trusts as worthy to receive the Scott Legacy Premium and Medal.

The Edward Longstreth Medal of Merit, founded in 1889, by Edward Longstreth, machinist, and late member of the Baldwin Locomotive Works. This medal is of silver, and may be awarded for useful invention, important discovery and meritorious work in, or contributions to, science or the industrial arts.

Full directions as to the manner and form in which applications for the investigation of inventions and discoveries should properly be made, will be sent to interested parties on application to

WILLIAM H. WAHL.

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

STABLE OF MESSRS. KENNY & CLARK, WEST CHESTER PARK, BOSTON, MASS. MESSRS. PEABODY & STEARNS, ARCHITECTS, BOSTON, MASS.

[Gelatine Print, issued with the International and Imperial Editions only.]

DWELLING, NEWARK, N. J., FOR CHARLES P. BALDWIN, ARCHITECT, NEWARK, N. J.

THE bricks for this front are of two colors as indicated. The lower story, the main cornice and the angle quoins are of Pompeiian brick of various shades. The main wall surface of second and third stories of the front, including the frame enclosing windows, is of "old-gold" brick of varying shades. The bricks were specially burned for the building.

PORCH TO HOUSE OF G. S. FRASER, ESQ., WASHINGTON, D. C. MESSRS. HORNBLOWER & MARSHALL, ARCHITECTS, WASHINGTON, D. C.

THE material used in building this porch is Potsdam red sandstone.

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PARISH-HOUSE FOR THE CHURCH OF THE REFORMATION, BROOKLYN, N. Y. MESSRS. DEHLI & CHAMBERLIN, ARCHITECTS, NEW YORK, N. Y.

HOUSE OF W. W. KENT, ARCHITECT, LAWRENCE PARK, BRONXVILLE, N. Y.

DESIGN FOR COURT-HOUSE, SPOKANE, WASH. MR. JOHN PARKINSON, ARCHITECT, SEATTLE, WASH.

[Additional Illustrations in the International Edition.]

CHOIR-SCREEN IN THE CATHEDRAL OF RODEZ, FRANCE.

[Copper-plate Etching.]

In almost all the old Gothic basilicas built from the twelfth to the fifteenth centuries, the chapters created about the high-altar a little structure made of enclosures of stone finely worked and decorated. Nothing is more curious and impressive from an artistic standpoint than the effect produced on the visitor when he penetrates within this sanctuary, which constitutes the forum of the officiating priests. Here is presented to the eye a monumental little *salon*, as it were, in which groups of chanters, choir boys, canons and various officials produce on days of great ceremonies effects of color and luxury which are absolutely peculiar to themselves. On such days, in fact, this precinct is garnished with fine carpeting, flowers, choir men and boys clad in brilliant colors, and from the whole space escapes the odor of incense and the harmonies of chant and organ tones, giving to the whole sanctuary a festal air which is strongly at variance with the austerity of the great nave where the faithful are massed together. It is in this rather theatrical idea that must be sought the origin of these choir enclosures. In our modern churches the clergy seem to have actually rejected the decorative principle, and in certain of the old cathedrals, as at Rouen, for instance, the prelates have caused the demolition of the existing choir-screens. What sort of religious idea it may be that commands the enforcement of such theories, we, as artists, can only bitterly regret its results.

PORTION OF THE NORTH FRONT OF THE AGRICULTURE BUILDING, WORLD'S FAIR, CHICAGO, ILL. MESSRS. McKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

THE LONG LIBRARY, ALTHORP PARK, NORTHAMPTON, ENG.

BISCUIT FACTORY, READING, ENG. MR. GEO. W. WEBB, ARCHITECT, READING, ENG.

This building is in course of erection in South Street, Reading, adjoining the Baths, the whole of the property having been purchased for a new factory by Meaby & Co., Limited. The first portion now building has a frontage of 72′ x 150′, and is carefully planned (after visits of inspection to various buildings used for the manufacture of biscuits) to meet all modern requirements suitable for the production of biscuits of every kind. The various departments are connected by elevators for the rapid conveyance of goods, etc. Travelling-ovens are on the ground-floor, and the Scotch, French and other hand-ovens form a separate department. The building is faced with local red bricks and dark-red tiles of local make.

OLD TIMBER HOUSE (CIRCA 1450), CHEESEHILL ST., WINCHESTER, ENG.

The street in which this house stands is a very ancient one, older indeed than the two partly Norman churches of St. Peter and St. John, about a hundred yards apart on the opposite side, as is proved by their east-end walls being built to its curve. "Of the name Cheesehill," says Mr. Lucas, "I have heard two derivations — one from A.-S. *ceosul*, a beach, and another in the name given to the spot at which the cheese fairs were formerly held. Yet it seems to me that the steep slope beside a stream in a grazing country might get its name rather from *cisaille* (Old Fr.), shears, as it is where the sheep on the downs would be driven for shearing." The house is supposed to have been the rectory of St. Peter's Church. There is a wealth of old oak in its floors and walls; the best detail, however, is in the barge-boards, which are of ordinary design, but in which the proportion of depth and projection in the cusping is admirable. It is a pity that an execrable repair to the one most distant is still unaltered, although it was pointed out to the present owners more than a year ago.

Bilian Wood. — The strongest timber is said to be that known as "bilian," or Borneo ironwood, whose breaking strain is 1.52 times that of English oak. It is a hard, durable wood of a dark-brown color, turning to a deep red when seasoned, and becoming as black as ebony on long exposure. It resists the teredo — the dreaded timber-destroyer of the salt water — and the white ant, and is almost indestructible. It also has the property of neither swelling nor shrinking under any degree of dryness or humidity. Its weight is 60 pounds per square foot, that of lignum vitæ being 83 pounds, boxwood 80 pounds, ebony 74 pounds, and African oak 62 pounds. — *Invention.*

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

THE ADVISABILITY OF LIMITING FLOOR-AREA.

Boston, Mass., December 20, 1893.

To the Editors of the American Architect: —

Dear Sirs, — One of the most important questions with which architects are especially called upon to deal, is the extent of floor-area, which may be permitted under Building Acts. Fire-Commissioner Murphy has lately called special attention to the very limited area of single floors which is permitted in European cities. I fully admit the expediency of dealing with this question, but there is another side to it of equal or even paramount importance.

First. — Floor-areas of even six or eight thousand feet maximum, are wholly inconsistent with the absolute necessities that govern a great many branches of industry.

Second. — The division of large buildings into small floor-areas separated by party-walls, has not proved to be a fully effective safeguard against very heavy losses by fire and the nearly complete destruction of very large buildings; because, of necessity, the smaller the floor-areas separated by absolutely close party-walls without doorways, the more numerous must be the stairways and other vertical openings. Party-walls which are of necessity fitted with frequent doorways are apt to be a very uncertain element of protection. If the attention of the framers of Building Acts, of owners and architects is turned too exclusively to a limitation of floor-areas, a much greater cause of loss by fire and a much more serious hazard in bad construction may be continued and may lead even to conflagrations.

My own experience in dealing with fire-hazard covers buildings of various kinds which are used, not only for manufacturing purposes but for the storage of very combustible substances. The smallest area of floor which comes under my supervision, either in factory or storage-building is, as a rule, larger than the maximum permitted under the present Building Act of the City of Boston. From this maximum which is our minimum, say six thousand feet on one floor, our supervision is extended over floor-areas reaching over one hundred thousand square feet without a break, cut-off or party-wall; yet there is no possibility of denying that the textile factories, the machine-shops, the paper-mills, the warehouses for the storage of cotton, wool, rags and paper, which come under my supervision, are safer buildings and better fire-risks, and that fires are more easily and quickly put out with small loss in these buildings, than even in city warehouses of the best construction of the present date, with here and there an exception. That exception will be found in a very few buildings in this city in which the architects and the owners have taken cognizance of a fire-hazard, which, in my judgment, is very much greater than a large area of floor, namely, open ways from floor to floor, or ways guarded only by wooden cut-offs of a combustible kind. In other words, the open vertical hazard is much greater than the open horizontal hazard.

I have in my mind a building of six floors in height, each just within the limit of the Building Act as, I believe, of six thousand feet per floor, making thirty-six thousand feet of floor-area in all. I regard that building as a much more dangerous one than one which might be constructed at less cost per square foot of floor of six floors of thirty-six thousand feet each, and much more hazardous than a one-story building of 36,000 feet in area. In that conclusion I may be completely justified by long and adequate experience.

If a building is constructed with due regard to all the rules that enter into mill-construction — to wit, floors of plank, grooved and splined, covered with top floor one inch thick, a layer of resin-sized paper between; such floor laid over heavy timbers set wide apart; free of sheathing on walls; free of combustible varnish; free of partitions of light wood and connected each floor with the other only by stairways in brick towers guarded at the doorways with proper fire-doors — there is hardly a possibility for a fire to pass from one floor to another, even if each floor is occupied for hazardous purposes or for the storage in quantity of hazardous merchandise; *provided*, the safe-guards and means for putting out the fire are established with a view to the maximum of danger.

There are very few branches of industry which are more hazardous in their processes than the textile arts. There are very few descriptions of merchandise which can be stored in piles nearly to the ceiling more hazardous than cotton in bales; yet it is not worth exceeding a quarter of one per cent per annum to insure textile factories against loss by fire for a term of years, and it is not worth an eighth of one per cent per annum to insure cotton in storehouses of very large area, when both the factory and the storehouse are properly constructed and protected.

The factory floor of right construction has never been burned through by a fire originating in any room of the working department. All extensive fires have found their way either through belt-holes, by elevator-shafts or stairways. There is but a single instance in which the well-constructed floor of a store-house has been burned through

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by the combustion of the contents, and in that case the fire made a hole which helped the fire-department in putting out the fire by sending a hose-stream through it.

These statements held good even before the introduction of the automatic-sprinklers. Of course that appliance has enabled us to take the risk of increasing floor-areas in very much larger amounts than ever before. We had not full confidence in the power of automatic-sprinklers to hold a fire in cotton warehouses until very lately, although we had full confidence in the automatic-sprinkler protection of cotton in its progress on the machines through the different rooms of the factory. Within the last two years we have gained confidence in the power of automatic-sprinklers to hold a fire even in a storehouse. The latest example is the most extraordinary one yet known. The account of this fire has been sent to me by Mr. John Hill, of Columbus, Georgia, an engineer of highest repute, himself the inventor of one of the best automatic-sprinkler heads. It is as follows: —

COTTON WAREHOUSE FIRE.

PIEDMONT MILLS, PIEDMONT, S. C.

A fire occurred in the cotton warehouse of Piedmont Mill, November 26, 1893. A mill operative, on Sunday morning about 7.30 o'clock, in passing the warehouse noticed water flowing under the door of the lower story. He reported the fact to the mill superintendent who, supposing the pipe had burst, sent the Master Mechanic to repair it. This warehouse is built into the hillside in such a way that the entrance to the lower story is from the ground on the lower story on one side, and on the other side from the side-hill to the doors of the upper floor or second story.

The Master Mechanic entered the door of the middle compartment, there being three compartments to the warehouse, separated by two through walls. The door-sill of this compartment is one foot above the floor level, and he found the floor a foot deep in water and water dripping through the upper floor. Passing around and entering the upper story he found it full of smoke, and seven Grinnell sprinklers open and distributing water. A large number of men were promptly at work removing the cotton-bales. The upper floor of this compartment contained 829 bales, and the lower floor 131 bales, a total of 960 bales. It was packed in solid mass without passages as closely as possible, and to a height of from 10 to 12 feet and to within about two feet of the sprinkler pipes. After some 500 bales had been removed, it was discovered that 36 bales of cotton were on fire internally, the sprinklers drenching with water the outside, preventing the fire from reaching the exterior of the bales.

The position occupied by these 36 bales in the mass stored was about the middle, between side walls and towards the back end of the compartment. The size of the compartment is about 30 feet wide by 70 feet long, and height of story 12 to 14 feet. The bales on fire were lying on a bottom tier of bales free from fire, and there were other bales piled together on top of them, none of which were on fire; so that it was confined in the middle of the height and width of the compact mass of uncompressed cotton bales. The burning bales had not disintegrated, and each was carried out separately and all cotton removed.

Water is supplied to the sprinklers from a reservoir of some 50,000 gallons capacity, located on the hill above at an elevation of about 40 feet above the cotton. The amount of water discharged by the seven open sprinklers, as shown by the amount drawn from the reservoir, as well as that necessary to thoroughly soak the large amount of uncompressed cotton and to fill the basement floor, 30 by 70 feet, one foot deep in water, as well as to pour a stream from under the doorway, indicates that the sprinklers must have been opened and operating from ten to twelve hours previous to discovery, and that they had held the fire in check for fully that length of time in bales solidly packed in a mass of cotton bales and to its interior. The building was not scorched and gave no evidence of a fire having occurred.

The 36 bales of cotton on fire were packed into the warehouse November 1, 26 days previous to the discovery of the fire. All of the 960 bales in the compartment were packed into it previous to November 16, at which time the doors were closed and locked, and no one had entered the compartment since that date for the ten days intervening. The value of cotton in this compartment was $39,000. The value of cotton in all three compartments of the warehouse was $140,000. The insurance on cotton and building was $150,000, written by the Syndicate Committee of Stock Companies.

The loss was promptly adjusted as follows:

724 bales water-soaked and damaged thereby at $3.28 each,	$2,374.72
36 bales on fire, less 33 per cent salvage (2-3 loss) . .	887.00
Total loss as adjusted	$3,261.72

I write this communication, not for the purpose of heading off any proper regulations in limiting the areas of floor-surface in city warehouses, but there is grave danger of carrying the restrictions of Building Acts too far. There are some very absurd provisions in the present Building Act of the City of Boston which increase the cost of buildings by adding to the hazard in case a fire should get well underway. Building Acts have been passed affecting some other places which have unhoused the poor by making the cost of constructing dwelling-houses so great that they could not be built so as to be let within the limits of the income of people earning average wages as laborers.

The true lesson which I have reason to think might be brought from London and from Paris has not yet been touched either by Mr. Murphy or by any public official or architect within my knowledge. When I go again to London and Paris it is my purpose to make an investigation on my own behalf of the method of constructing a floor at very low cost either in a dwelling-house, small shop or warehouse or workshop which shall be as safe, or safer, against the vertical extension of fire as the factory floor is which has been developed under the supervision of the Factory Mutual Insurance Companies.

I have reason to believe that while our students of architecture have been devoting themselves to the fine art in their studies in European countries they have wholly overlooked the useful art of constructing buildings in a safe manner against fire, such as might be constructed with the use of our own materials at moderate cost. I should like to see one student sent abroad under some one of the travelling funds, with instructions to limit his whole course of study to the art of building a safe and useful building out of the materials which are available in this country, giving only such consideration to æsthetic effects as may be consistent with the use to which such buildings are to be put.

The safety of European buildings is very apt to be attributed to the use of materials of which we have no counterparts; such as the very cheese-like stone commonly used in Paris, which hardens after it is placed in position. This, however, only affects the outside structure. The methods of constructing and finishing the inside of low-priced buildings in Paris and in London are safer, better and cheaper than our own. There are methods to which our more expensive labor can be applied and yet a lower cost may be attained than we now secure.

I make these assertions somewhat dogmatically. I cannot at present prove them, but I have picked up here and there information on these subjects which I should have long ago put together and brought into practice, had this class of buildings come under my official supervision.

The common method of combustible architecture practised in this country is not only hazardous but it involves a stupid waste of money which is due to ignorance of better methods more than to anything else. Little or no attention seems to be given to the missing-link between the ordinary practice of combustible architecture and the expensive method of what is called fire-proof construction.

If I am wrong in this, I will admit it when any one proves to me that in any school of architecture, or any technical school, or technical branch of a university in this country the attention of the students is habitually called to the consideration of the fire-hazard when the art of constructing dwelling-houses or other like buildings is being taught them. If there is such a course of instruction of any kind I should be glad to know where it is given.

If the year presently to end ends even without a great conflagration, the ash-heap of the present year will amount to one hundred and fifty-million dollars ($150,000,000) or more. What action has been taken anywhere in any technical school of any kind to save this waste? May not this waste be attributed in about equal proportions to stupidity, ignorance, carelessness and crime, to be assigned in various proportions to owners, occupants, architects and builders alike?

EDWARD ATKINSON.

RE "PROVIDENCE CHURCH."

NEW YORK, N. Y., December 28, 1893.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — We have received your very fine reproductions of the Providence Church decorations, which appeared in your issue of December 23. We are sorry that we neglected to mention that the painted decorations were the work of Mr. H. T. Schladermundt of New York, and would appreciate a notice in your paper to this effect.

Yours truly, CARRÈRE & HASTINGS.

NOTES AND CLIPPINGS

THE SYSTEM OF THE PARIS MONT DE PIETE ADAPTABLE FOR THIS COUNTRY. — The City of Paris is a model to the world in the matter of loans to the poor. Its Monte de Piété is managed in a manner that has called out the enthusiastic approval and commendation of every observer. All its operations are under the careful supervision of the public authorities. The rate of interest required upon loans is extremely low — so low in fact, that the borrowers never complain of it or look upon it as in the least excessive. The loans made upon pledges approximate very closely in amount to the actual market-value of the articles pledged. The facilities for redemption are ample and convenient. In every department and in every detail the Monte de Piété is conducted in such a way as to be of vast benefit to the poor of Paris. The amount of its profits is strictly regulated by law. It is impossible under its system that any exaction or any injustice shall be practised. New York sadly needs a Mont de Piété. The *Tribune* has already suggested that philanthropists who feel acutely the urgent need of relief to the poor should promptly organize an institution resembling that in Paris. Such an institution would almost certainly make a fair return on the investment, and properly managed would be of unlimited advantage to people in all parts of the city who need aid in this trying season. The great Paris pawn-shop is not the only one in the world which has achieved a striking success with a moderate rate of interest and with generous treatment of the borrowers. Similar institutions exist in Denmark and some other countries, and an experiment of this sort has proved successful in Boston. The subject is worthy of immediate consideration on the part of public-spirited citizens, while the duty of the Legislature is obvious and imperative. — *N. Y. Tribune.*

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Dumas's Monte Cristo Chateau. — The success of "*Monte Cristo*" was enough to tempt the great Alexandre Dumas to prove to the world that the vision of the subterranean palace in the island of treasure was not merely an affair of words, but that he could also create a similar prodigy above the ground and not far from Paris. He was not the only writer of romances who was impelled to dream about building. Dumas selected a site on the road from Saint-Germain to Port-Marly, a region which is one of the most picturesque about Paris. For the new château he adopted the Italian style and imported Italian workmen in order to insure that it would have the genuine characteristics. But it was not long before he realized that conventional coldness or purity did not correspond with his dreams. Tunisians were then brought over to give a Moorish character to the interior. Landscape-gardeners were allowed to transform the ground into something that would be to Versailles what the owner was to Corneille. But as terror is the source of the sublime, the creator of Edmond Dantes also erected a miniature Château d'If in the midst of a neighboring pond, and the prison-house was approached by a drawbridge that was as coquettish as those to be seen in front of the suburban villas of Holland. Artists were able to make wonderful pictures out of the tea-gardenish architecture, and shocked precisians with scenes of luxury which outdid Eastern fables. Meanwhile the brave Alexandre felt he had immured himself in a bandbox, and in order to breath with comfort he resolved to turn traveller. He discovered also that, wide as had been his experience of duns, he had met with none to compare with those that were incubated during the building operations. The freak gave rise to accounts amounting to 10,000*l*. Dumas had no longing to go back to Monte Cristo. It passed into the possession of several proprietors in succession and the transfers must have been profitable to the notaries. As it has once more come into the market we thought a few lines might be allowed to recall one of the strangest attempts to realize a writer's visions of architecture. — *The Architect.*

How a Picture-stealer utilized his Deformity. — If any American collectors have, as a Munich paper asserts, been recently investing in sketches by Prof. F. von Lenbach, the great German portrait-painter, here is a chance for them to unburden their consciences. Some two years ago a man applied to Professor Lenbach for work, claiming to be a porcelain painter, modeller in stucco and repairer of frames. The Professor gave him odd jobs at repairing frames for him. He performed this work in the basement of the artist's house, where the latter kept stored away the great mass of sketches and studies he had made of his different sitters, previous to painting their actual portraits. The frame-mender soon discovered these, and was naturally aware of their value, so he commenced to steal them as opportunity offered. Some he carried away in the portable box in which he kept his materials and tools. Others he removed in an entirely original manner. He is a hunchback, and he ingeniously hit upon the idea to conceal his plunder in the hollow of his back below his hump, putting the sketches between his tightly-buttoned vest and his shirt, so that when his coat hung from his rounded shoulders, no one could suspect that it hid anything but his crooked spine. In this way and that he contrived to get away with over a hundred sketches and studies, among them thirty, made from life, of Prince Bismarck alone. He sold his stealings among the small-fry art-dealers, who can be conveniently blind at a bargain, for from 15 to 100 marks apiece, and secured altogether about 3,000 for what would have sold at auction for from 10,000 to 15,000 marks. He might have escaped discovery had he not, as usual with such knaves, become too greedy. Not satisfied with the product of his thefts, he got some art students to copy the sketches he stole, and having sold the originals sold the copies as original also. These copies came to the artist's notice, and led to an investigation and the rascal's arrest. The plundered pictures were mostly, it is stated, sold to American and English tourists. — *The Collector.*

The Survey of the Okeefinokee Swamp. — Several attempts have been made during the last twenty years to get a correct survey of the Okeefinokee swamp, and, until three years ago, they were all failures. The great difficulty experienced by all explorers of the swamp was caused by the jungles and a treacherous and dangerous mud, which is known as "quick mud." The hearts of the bravest men have failed them when their advance into the swamp was interfered with by these obstacles. Without a moment's warning or any signs of danger, the feet slip into the treacherous mud, where the depth ranges from five to fifteen feet in depth or the jungles become so dense that an entrance cannot be effected. There is a dense growth of small pine saplings and black cypress. In some places the saplings give way when caught hold of by a man who is sinking in the mud. Thus the surveying of the swamp requires skill and judgment. A boat is not sufficient to take one into the heart of the swamp on account of the shallowness of the water where the "quick mud" is most abundant. Three years ago a very nearly correct survey of the swamp was made under the auspices of the Suwanee Canal Company. The survey was led by Obadiah Barber, who has explored the swamp over 100 times, and is familiar with every nook and corner of the mysterious place. Mr. Barber says that he led the corps of engineers through the rough places of the Okeefinokee, and though the party was composed of strong men they were exhausted in strength when they reached the opposite side. The swamp, by this survey, proved to be fifty miles in length and twenty miles in breadth. This survey does not correspond with those on maps of this State. — *Savannah News.*

To Dam the Colorado. — A united effort will probably be made during the coming winter to induce the general government at Washington to lend aid to an irrigating proposition that will, when completed, cover a large area of what is now desert land. The plan is to build a dam in the Grand Cañon of the Colorado, the framework of which will be steel of such strength as to resist any pressure that might be hurled against it during the summer floods. Above the framework, boulders will be placed as a protection, and thus it is proposed to make a sufficient fall to furnish water-power for pumping the water to the plain above, where it may be carried in a big canal to the various locations where it is needed. The power will be furnished by turbine wheels, and a sufficient number of them may be brought into requisition to take out any amount of water desired. The fertile valleys that can be reached in this way are Wallapai and Sacramento, in Mohave County; Aubery, in Coconino; Chino, Williamson, Kirkland, and several other small valleys in Yavapai that extend south to the Salt River Valley in the vicinity of Phœnix. The supply of water in the Colorado is an unfailing one and sooner or later it will be the source of all great irrigation enterprises in Arizona. — *Phœnix, Ariz., Republican.*

The Story of a Bell. — In the church-tower of the little town of Grosslaswitz, in the north of Germany, hangs a bell, and on it is engraved its history, surmounted by a bas-relief, representing a six-eared stalk of corn, and the date October 15, 1729. This is the story of the bell: At the beginning of the last century the only church-bell at Grosslaswitz was so small that its tones were not sufficient to penetrate to the ends of the village. A second bell was badly wanted, but the village was poor, and where was the money to come from? Every one offered to give what he could, but the united offerings did not amount to nearly enough for the purpose. One Sunday when the schoolmaster, Gottfried Hayn, was going to church, he noticed growing out of the church-yard wall a flourishing green stalk of corn, the seed of which must have been dropped there by a passing bird. The idea suddenly struck him that perhaps this one stalk of corn could be made the means of producing the second bell they wanted so much. He waited till the corn was ripe, and then he plucked the six ears on it and sowed them in his own garden. The next year he gathered the little crop thus produced, and sowed it again, till at last he had not room enough in his garden for the crop, and so he divided it among a certain number of farmers, who went on sowing the ears until, in the eighth year, the crop was so large that when it was put together and sold they found that they had enough money to buy a beautiful bell, with its story and birthday engraved upon it, and a cast of the corn-stalk to which it owed its existence. — *London Globe.*

The Prices paid by Paris and by France for Art Works. — A curious and not uninteresting item of information is furnished by a Paris correspondent of the *Münchener Neueste Nachrichten.* He states that while the Government pays a certain price for the decorative art upon its buildings, the City of Paris prides itself on being richer and paying better than the State. Thus Puvis de Chavannes, working for the municipality, received 35,000 francs for his decorations in the new saloon of the Sorbonne, and François Flameng and Théodule Chartran each got 4,000 francs for their decorations of the staircase. Had this work been done on a Government building, it would have paid them just one-half, the contract prices being: City, 500 francs a square metre; State, 250 francs. No wonder that Parisians claim that Paris is France. — *The Collector.*

The Mosque lately burned at Damascus. — The Amawi Mosque in Damascus, which was destroyed by fire last month, is a serious loss to Moslem architecture. It was built in the seventh century, not long after Mohammedanism conquered Syria, and is calculated to have cost more than $12,000,000 in modern money. It was the largest mosque and the most ancient in the world, and had a famous marble floor. With it were destroyed manuscripts of priceless value, one copy of the Koran being in the hand of the celebrated author and penman, Othman. The Sultan has sent five architects and engineers to Damascus to rebuild the mosque and adjacent dwellings at his expense. — *N. Y. Times.*

A Testing-machine for Cornell. — A testing-machine company in this city has completed for Cornell University a vertical screw-power testing-machine of 400,000 pounds' capacity. The machine will test specimen bars of metal ten feet in length, and is also adapted for crushing tests of cement and similar materials. It is the largest screw-power machine ever constructed in the United States and perhaps in the world. The gearing is of cut steel, and an arrangement of clutches permits the operator to run the machine up or down at will. The connections with the beam are electrical and practically automatic. The portions of the machine which have to bear the strain of testing are particularly strong, and the adjustments of the bed and of the beam, with its automatic arrangements, are of a character to delight skilled mechanics. — *Philadelphia Ledger.*

Mahogany Roadways. — The laying-down of mahogany roadways sounds almost like a dream of Oriental magnificence, but it is what the Paris Municipal Council are engaged in at the present moment. A portion of that almost interminable thoroughfare, the Rue Lafayette — that portion nearest to the Eastern of France Railway terminus — has been pulled up, and workmen are laying down blocks of real Brazilian mahogany of a peculiarly-fine texture and color. It was confessedly an experiment, as the mahogany is dearer than the woods ordinarily used for the same purpose. Mahogany, however, is not as dear as it used to be. The actual cost of the new roadway will be 50 francs a square metre, which is considerably less than £2 a square yard. It is hoped that the extra outlay incurred will be more than compensated for by the greater durability of the material. — *U. S. Government Advertiser.*

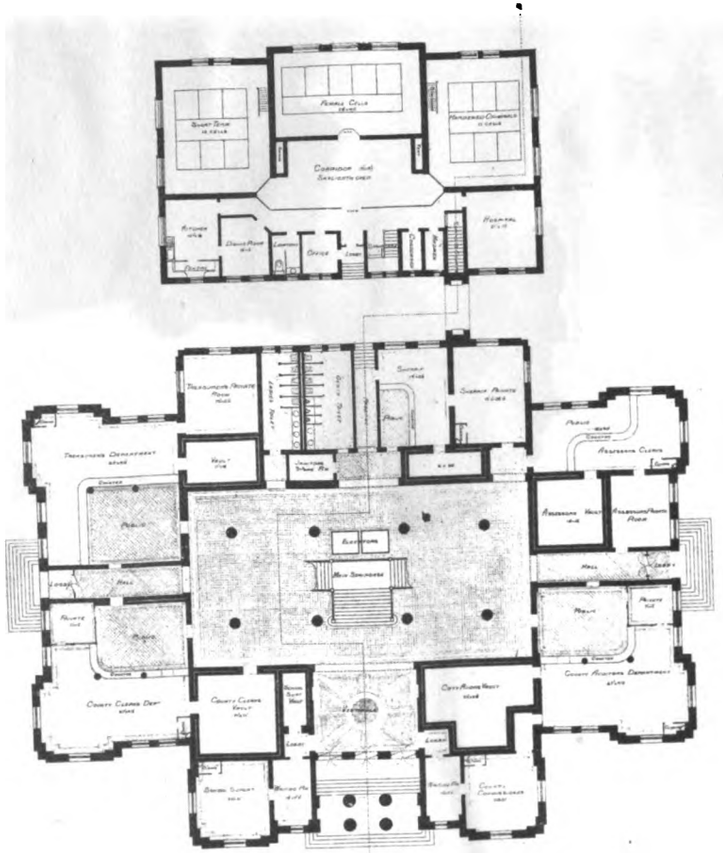
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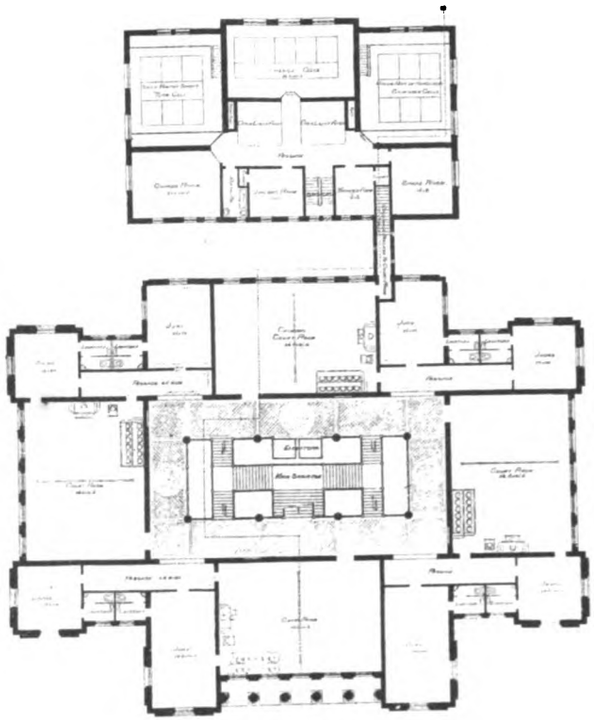
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COMPETITIVE DESIGN
FOR THE
SPOKANE COUNTY
COURT HOUSE
John Perkinson Archt Seattle.



FIRST FLOOR PLAN



SECOND FLOOR PLAN



SECTION ON LINE "A B"

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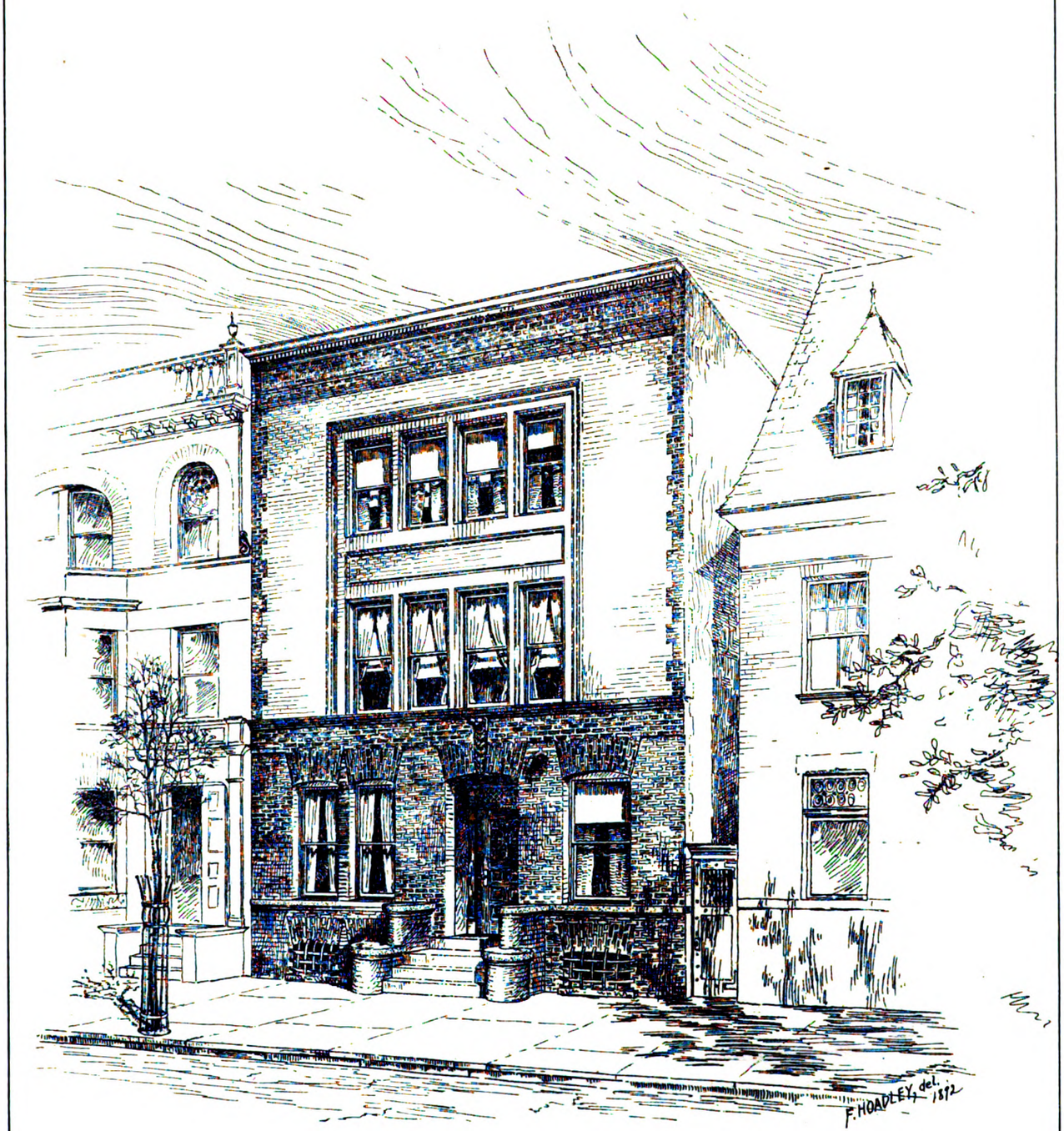
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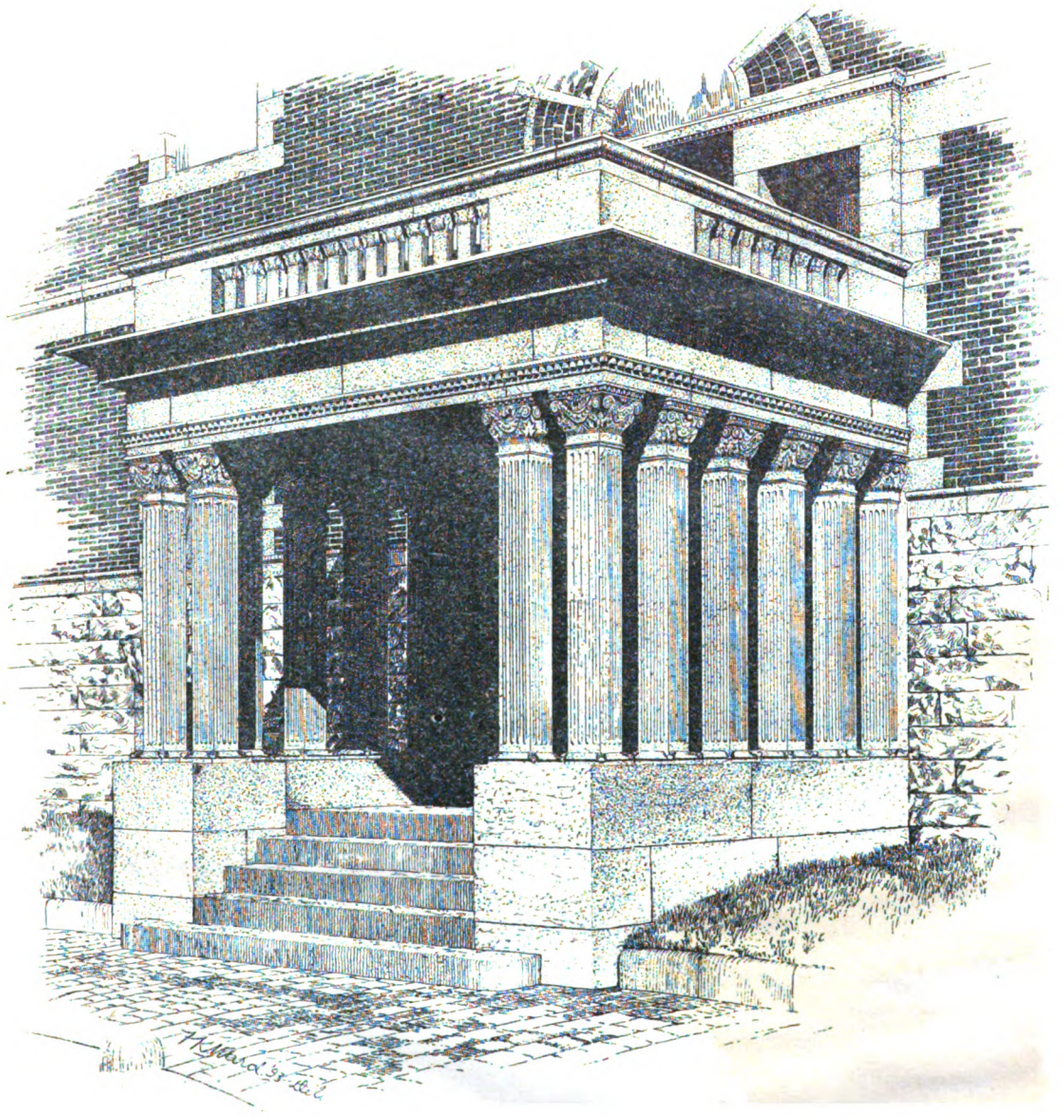


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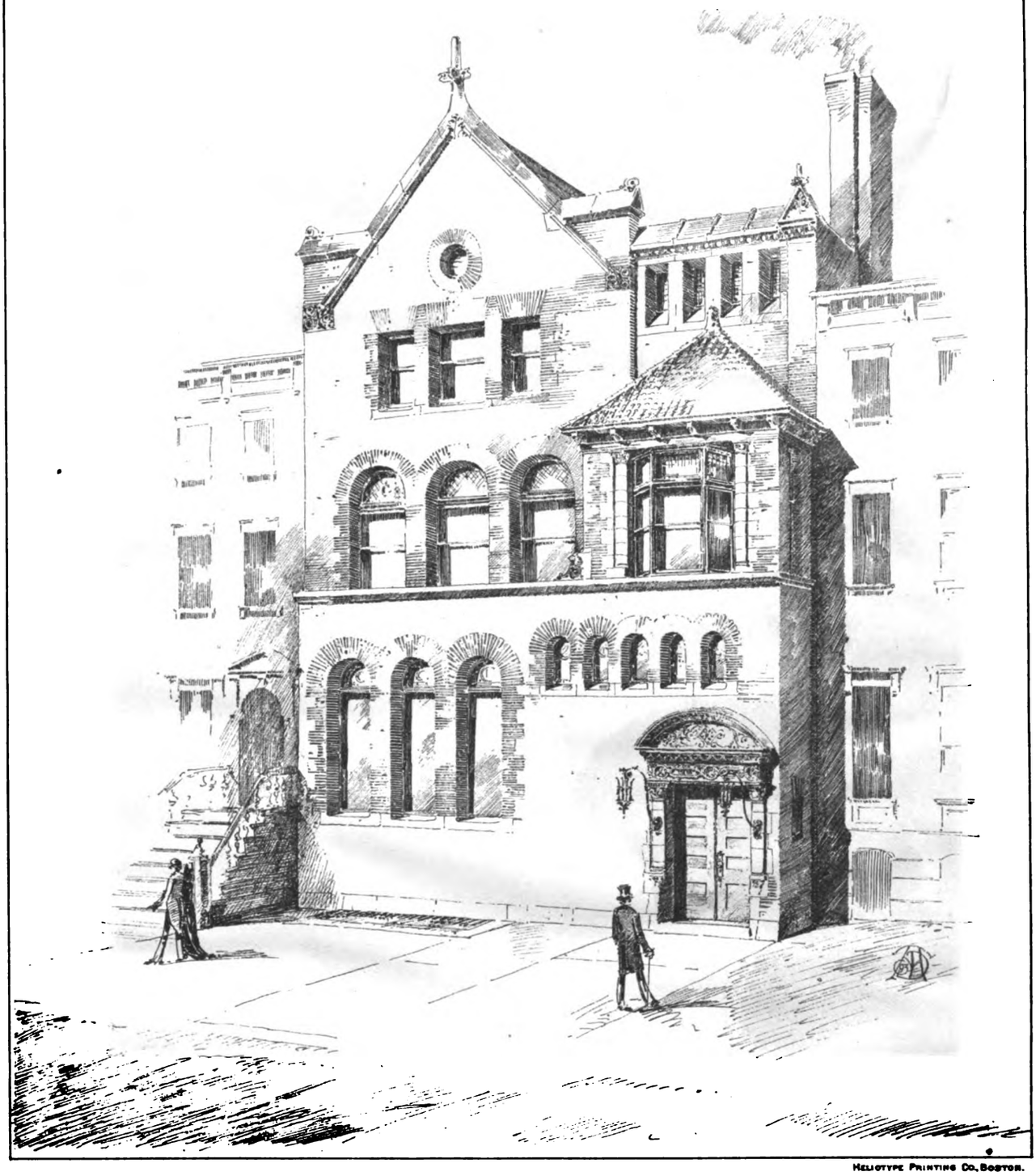
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THERE is a common superstition, which probably retains its hold upon builders solely through the profit that they find in maintaining it, but which sometimes really imposes upon laymen, to the effect that cement mortar is improved, in cold weather, by the addition of lime to it. As the mason ingenuously explains to his employer, the heat developed by the lime, in slaking, keeps the cement warm, and thus prevents it from freezing; and, on this theory, the advent of a frosty day is utilized by multitudes of sharp builders to load the mortar, which they have agreed to make of sand and cement only, with a quantity of lime, which saves cement, and makes the mortar easy to work, but destroys its waterproof qualities, and injures its strength and hardness more or less, according to the quantity used. It is hardly necessary to say that the influence of the lime in "warming" the mortar is purely mythical. Lime mortar, without cement, is not much injured by freezing, while cement mortar is totally ruined, so that a mortar containing a large proportion of lime would be harder, after freezing and thawing, than one containing cement only; but it would gain the qualities of lime mortar only as it lost those of cement mortar.

THE fact is, that the only time when it is desirable to add lime to mortar, which the contract requires to be made with cement, is in the summer. In very hot weather, cement, particularly of the quick-setting sorts, will sometimes harden in the mortar-tubs before it can be used. The average workman chops up the lumps, and re-tempers them, with more water, but this proceeding destroys half the value of the cement, and it is preferable, under such circumstances, to add a small quantity of lime to the cement, at the first mixing. A very small dose of lime will retard the setting of the cement long enough to make it manageable, without materially injuring its properties, and circumstances sometimes render it absolutely necessary to resort to such an addition, in order to be able to work the cement at all. In winter, on the contrary, the object to be aimed at is to accelerate the setting of the cement as much as possible, so as to place it beyond the reach of injury from frost, which, if kept out for twenty-four hours, has little effect upon good cement. In order to secure this rapid setting, however, all trace of lime, which is a powerful retardant, must be carefully kept out of the mortar, and the bricks or stones which are to be set with the mortar must be thoroughly warmed before they are laid. To warm the mortar alone is perfectly useless. A bed of mortar, spread on one cold stone, and with another cold stone lowered into it, will freeze completely through in a few seconds, even though it may have been boiling hot when it was spread; and we have seen, in a warm day, with the temperature well above the freezing-point, stonework in cement mortar freeze almost as fast as it was laid, simply because the stones had been cooled down during the cold day and night previous, and had not had time to get warm. It is obvious that, roughly speaking, it would require four tons of mortar, at a temperature of forty degrees Fahrenheit, to raise a single stone, weighing one ton, from zero to thirty-two degrees, so that the whole mass would be just on the verge of freezing; yet the masons would have us believe that, by adding a little lime to the mortar, they enable a hod-full of it, not only to raise above the freezing-point the temperature of a large mass of masonry from a point in the neighborhood of zero, but to hold it there, notwithstanding the temperature of the surrounding air, until the cement has had time to set. By warming the stones, or bricks, the conditions are reversed. A heated stone will keep the mortar in which it is laid above the freezing-point as long as it remains itself above that point, and, as either stones or bricks lose heat very slowly, it is easy to build, in the coldest weather, a wall which will retain, in the interior, a temperature above the freezing-point long enough to make the cement in which it is laid secure against frost, except in the superficial portions; and, with suitable coverings, these may also be protected. Mr. O. W. Norcross, one of the most ingenious and careful of builders, warms foundation-stones with a jet of steam, before laying them in cement in cold weather, but this is an expensive process, if thoroughly carried out, as the heat penetrates very slowly into the mass of the stone; and a better way is to pile the stone or brick over a furnace of some sort, in which a moderate fire can be kept, night and day. We have once or twice made use of the low, flat furnaces used by the workmen for heating pebbles who lay coal-tar concrete. Three or four thousand bricks can, with care, be piled over one of these furnaces, the chimney coming up through them, and, by renewing them as fast as the hod-carriers take them from the pile, the masons can be constantly supplied with hot bricks, which will make excellent work with cement mortar, in the coldest weather; and, as the furnace is tight, there is no danger of spoiling the appearance of the bricks by smoke.

THE New York *Evening Post* quotes some sensible remarks made by Mr. Brady, the head of the New York Department of Buildings, on the new iron construction. It will be remembered that several of the engineering journals have recently criticised the new buildings of protected iron which are being erected in New York, and, probably without intending it, have given to their readers an unfavorable idea of the system. Superintendent Brady points out that the criticisms really apply to the details of execution, rather than to the system, and would be equally applicable to structures of brick and stone, were it not that the trivial oversights which hardly affect appreciably the stability of a building of masonry may be fatal to a structure so highly organized as a modern protected-iron office-building. Many already know that one of these buildings, in process of construction, of which the iron skeleton had nearly reached the roof level, was blown some ten inches out of plumb the other day by a high wind. On examination, it proved that the uprights, which were of cast-iron, instead of having top and bottom plates planed and bolted together, were left rough, and simply superposed, the vacancies occasioned by the irregularities of the cast surfaces being "shimmed" up with bits of sheet-iron. It is hardly necessary to say that any architect would look with horror on such ironwork, but it is impossible for an architect, or, as Mr. Brady says, for the deputy inspectors, to supervise the making of all the joints, a defect in any one of which may cause the ruin of the building. Mr. Brady says that, in such buildings, the plans for the iron-work, made by the architects, and approved by his Department, are often varied from by the contractor, for his own profit. The number of bolts and rivets is reduced from that shown on the detail-drawings, and, where bolt or rivet holes have been carelessly punched, so that they do not correspond, one is often lengthened, until the rivet will go through, with the result, perhaps, of utterly destroying the rigidity of the joint. There are few architects who have not had trouble with iron-contractors, even for the simplest work, and it may be imagined how great is the opportunity for "skinning" a large structure, if the contractor is so disposed. Mr. Brady,

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who is good authority, thinks that dangerous malpractice on the part of the contractors for such structures can be prevented only by having a deputy-inspector from the Department of Buildings assigned to watch each building. It has always been the praiseworthy practice of the New York Building Department to revise very carefully the architect's drawings, to recalculate the weights on the piers and girders, and examine the details of riveting and bracing, and, with copies of the approved drawings in his hands, and an inspector constantly on the ground to see that the work was executed in conformity with them, it would be possible to secure reliable iron construction, but it is hardly possible to secure it otherwise.

A GOOD many people are interested in the competition for the New York City-hall, and may like to hear that the report of the expert jury has been presented to the New Municipal Building Commission. According to this report, the jury consider No. 13 to be the best, so far as exterior design is concerned, but find the interior arrangement unsatisfactory. Next to this they prefer Nos. 23, 28, 35, 107 and 113. Those competitors who know what was the number assigned to their plans may thus see whether they are among the fortunate ones. No plan was, however, found by the jury to be quite satisfactory in regard to the arrangement and lighting of the interior rooms and corridors, and they thought that whichever was adopted would have to be more or less modified. In answer to a question of the Mayor, the jury replied that they considered it entirely practicable to draw a plan which should combine the best features of the six selected designs, but nothing was said as to whether the person employed to make and carry out the combined plan should be the author of the design placed first, or some other person, and this point may be of some interest later. A little controversy arose as to the exact number of plans submitted, the report of the jury stating that one hundred and thirty-three designs had been examined, while it was understood that one hundred and thirty-four had been submitted. The Comptroller, Mr. Myers, remarked, with rather justifiable asperity, on the carelessness displayed in an official report which made it appear that one of the competing designs had not been considered by the jury at all; and the plans were referred back to the jury for an official count. In about ten minutes the jury reported that the correct number was one hundred and thirty-four. It was voted that the report be printed in full in the minutes of the meeting; but further action on it was postponed for a week.

THE profession has lost, within the last few weeks, two of its most distinguished German members, Baron von Hasenauer, of Vienna, and Professor Bauschinger, of Munich. Of these, Baron von Hasenauer was perhaps the most distinguished, but he was an old man, whose professional career was practically completed years ago, while Professor Bauschinger was in the height of his noble career, with the prospect of many years of still more extended usefulness before him; and, while the world will mourn with affectionate regret the last of the illustrious group of artists who have made the name of Vienna so conspicuous in the history of modern architecture, it will deplore as irreparable the loss of the brilliant experimenter who has added so much to our knowledge of the materials of construction.

THE prospect of a tunnel connection between New York and Brooklyn appears to have become very remote as the result of an explosion of dynamite which occurred at the works a year ago, by which five persons were killed, and many injured. The tunnel construction had already begun when the explosion occurred, and a shaft had been carried down to a depth of ninety feet, but the work was immediately abandoned, and nothing has been done since. A few days ago, by order of the New York Supreme Court, the ninety-foot shaft, with the lot of land containing it, was seized by the sheriff, to satisfy a judgment for fifteen thousand dollars, awarded as damages to one of the persons injured by the explosion. As the aggregate of the claims against the company for damages on account of the explosion is said to be more than five hundred thousand dollars, and as a small tract of cheap land with a hole in it, will not go far toward satisfying all the claims, the natural inference seems to be that the project will not be revived, unless some fresh company takes up the matter again from the beginning.

SOME curious trade-union performances seem to be going on just now. A few days ago a public meeting of the unemployed was called in New York to consider methods by which the distress among working-people, which is very great there, might be alleviated. If such a meeting could be managed by the quiet and sensible men who form the vast majority of mechanics, it might be of great use, but it was taken into complete possession by what the New York *Sun* irreverently calls the "jawsmiths." These worthies improved the occasion in their usual style. After proposing to form vast processions of the unemployed, and march them to the Mayor's office, to demand work, a motion was put, and carried by an immense majority, that all work furnished should be paid for at the rate of wages fixed by the several Unions. This seemed to be the principal point which the "jawsmiths" intended to make, for the meeting soon afterward broke up, after a dose of absurd rant about Capital and Labor from well-known Anarchists.

THOSE who are unacquainted with the arts of the jawsmith may not at once perceive the object of this resolution, which is simply a warning, and a terrible one, too, for the starving workmen to whom it is addressed, that they can receive the charity that their generous fellow-citizens so freely offer, only on such terms as are dictated by their cruel oppressors, who are determined that, even in the last stages of want and misery, their victims shall not escape them. To most people, the idea that a carpenter, who has a wife and children hungry at home, and finds a neighbor, a little less poor than himself, who can afford to keep the starving family supplied with shelter, food and fuel, but no more, in return for something that he has thought of that the mechanic can do for him, should be compelled by his tyrants to refuse the offer, and, in preference, to degrade himself and his children by begging at the public soup-kitchen, seems preposterous; yet this idea is just what the "jawsmiths" propose to carry out into practice, and the resolution passed at the "unemployed" meeting was a notice that the resources of Union terrorism will be employed to enforce it. The more intelligent and prudent Union mechanics have understood this before, and the extraordinary emigration of the past season, which has carried thousands of them out of the reach of the New York walking-delegates, shows their opinion on the subject; but there are many thousands left, who, compelled to choose between disobeying the Unions and beggary, will choose the latter, simply because they dare not do otherwise.

A RECENT instance, which comes to our knowledge, will serve to show how complete is the grip of the Unions on the fortunes of the unhappy workingman. A certain heating-contractor has a large shop, in which are employed a considerable number of men. These men have steady employment, are well treated, and are paid at least the Union wages, while they are allowed, if they choose, to do work out of regular hours, for which there is, in the heating business, always a great demand, and for which the men have extra pay. For some reason, connected with "the interests of labor," all the tinners in this shop were ordered to strike. After the strike had been in progress for some weeks, one of the tinners thrown out of employment applied to a friend of his, for whom he had formerly worked, for a job. The friend had nothing for him to do, but questioned him as to his circumstances. It appeared from the inquiry that the man, who was a good workman, and was allowed to do all the extra work he wished, had been receiving wages amounting, on an average, to thirty-five dollars a week, with the prospect of an equal, and probably increasing, income, as long as he chose to stay in the shop. His friend then inquired how much he was receiving as "strike pay," and, on being told, three dollars a week, frankly informed him that he was a fool, and that he had better go back to the shop, get down on his knees and ask his employers to take him back. The poor man replied, without the least resentment, "Yes, I know I am a fool, and I am glad to have you tell me so, but if I should go back, they would call me a scab;" and thus, out of pure terror of what would be done to him if he should get the ill-will of the Union, this unfortunate, who represents myriads of the best citizens that our Republic can boast, threw away, at the bidding of some alien schemer, a sure income of more than eighteen hundred dollars a year.

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THE ENGLISH RENAISSANCE.[1]



Fig. 1. Oxford: St. John's College, Garden Front.

WHILE the so-called Transitional or early Renaissance style of architecture — an Italian decoration engrafted npon a Gothic construction — was introduced into France from the first Italian expeditions, disappearing with François I, to be superseded by the finished Renaissance of Lescot, Bullant and Jean Goujon, in England the Tudor style termed the Perpendicular made its appearance with the fifteenth century and remained intact until the middle of the sixteenth, the period assigned for the beginning of the movement of foreign importation. The origin of this artistic revolution has been fixed at the date of the arrival in England, of the German painter-decorator Holbein [See "English Architecture," *American Architect* for February 21, 1891, *et seq.*], and thus has been explained the apparent resemblance between the English Renaissance and the German Renaissance.

The master from Bâle did, in fact, draw not only religious scenes, designs for windows and portraits, framing his subjects with motives borrowed from the architecture of the Renaissance, which became German under his pencil, but out of his fertile imagination he also supplied original designs and decorative adaptations to the art industries: chased-work, jewelry, gold-work, iron-work, arms, tapestry, etc. If we compare the numerous designs, outlines or sketches in the collections of the museums of Bâle and Berlin, and also of the British Museum, with certain of the objects of art executed in Germany, between 1520 and 1530, and in England, from 1530 to 1550, we can easily see how much influence the taste and imagination of Hans Holbein, the younger, must have had upon the development of the sumptuary arts.

And of special interest in considering the question of the introduction of the artistic Renaissance into England, is a design by Hans Holbein in the Berlin Museum, presenting a plan for a triumphal arch crowned by an allegorical group representing Apollo and the Muses. This festival decoration was executed in 1533, upon an order from the German merchants of the Steelyard in London, on the occasion of the marriage of Henry VIII with Anne Boleyn. In the absence of more definite information one might fix upon this circumstance as the début here of the boldest and most ingenious of the instigators of the German Renaissance; and it is comprehensible that as a result, the artist thus presented to the people

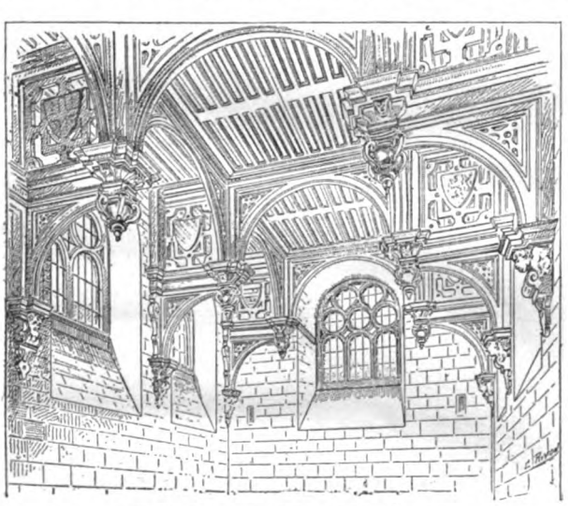


Fig. 2. Wollaton House: Hall Ceiling.

of England by his fellow countrymen, whether in person or merely represented by this important specimen of the new art, should become at once the fashion and should find himself patronized by influential persons, a Thomas More or a Colet, desirous of introducing into their insular country the artistic movement of the Renaissance, preceded, however, by the religious reformation.

Whether the portrait of the king of England [See "English Architecture," *American Architect* for February 28, 1891], was the pretext or the bait which took Holbein to London; whether an artistic revolution, premeditated or not, resulted from this acclimatization of the German Renaissance in England, and that as much in the costumes and their embellishments as in the decoration of objects of luxury, of arms and furniture, there is nothing inconsistent in all this, for it is well-known that Holbein left in London as well as at Bâle designs for costumes, for the chasing of sword handles and scabbards, for jewels and drinking-vessels, besides compositions for the decoration of books, etc. At this time, another German, Hans Mielich, designed the ornamentation of the armor made for François I, king of France.

But the distance between this and a direct influence on the monumental Renaissance is still too great for us to accredit to Holbein any large part in the transformation movement in architecture which, at the most, had but just dawned in England in 1550, some years after the death of this artist (1543). We might as well attribute the indisputable influence of Italian importations on the French architecture of the time of François I to the goldsmith-sculptor, Benvenuto Cellini.

Moreover, as we have already said [See "German Architecture," *American Architect* for August 15, 1891], the *architecture* of the German painters of Nuremburg, Augsburg, Ulm and Bâle was quite Platonic — even at home — and was confined to the decorative accessories of their painted compositions or of the plans that they furnished the industrial arts. These "*pourtraicteurs*" did not, as we know, move stones.



Fig. 3. Cambridge: Trinity College, Neville's Court.

It is to the Italian, John of Padua, architect of King Henry VIII, during the last years of his reign [died in 1546], that the honor is due of having extended to English architecture the Renaissance already realized in the other arts by the influence of the German artist.

The earliest examples of English Renaissance architecture, are then, at Somerset House (Strand), and Sion House (Middlesex), a direct importation from an Italian source, an application of the teachings of Vitruvius, or of the ancient monuments, to the forms and proportions of the various parts of a façade, the plan of which, nevertheless, meets wholly local requirements.

The princes and lords across the channel would not consent to modifications in their habits to suit forms of external decorations. But like the artists who had been warmed by the sun of Italy, the young English noblemen, on returning from the court of Florence — in the time of Elizabeth — brought back with them visions of the monumental splendors amid which they had passed the time accorded to the perfecting of their education, and also a desire to copy them. The "Tudor" and its "Perpendicularism," exaggerated and monotonous, had ceased to be pleasing to those of the English aristocracy in whom travel in France and Italy had engendered a love of the brilliant or picturesque, and a desire to alter and rejuvenate the aspect of their dwellings. The rest of the privileged class, continuing faithful to the traditions of their country, maintained for the melancholy, rectilineal niceties of the Tudor period, a preference which nothing was ever able to stifle wholly, and which at the close of the last century was so far revived as to constitute at the beginning of the present century, a complete return toward this entirely national type of mediæval English architecture.

Is not the garden façade of St. John's College at Oxford (Fig. 1), one of the oldest specimens of the Renaissance in England? It is said to date back to about 1555, that is to the early part of Elizabeth's reign. The general structure of

[1] From the French of E. Rivoalen, in Planat's *Encyclopédie de l'Architecture et de la Construction.*

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the bay and the dispositions of the bow-window, loaded with ornamentation after the Italian manner, are still Tudor, decorated in the new style. As for the door, it is almost absolutely Italian — with a touch of Flemish — in the framing

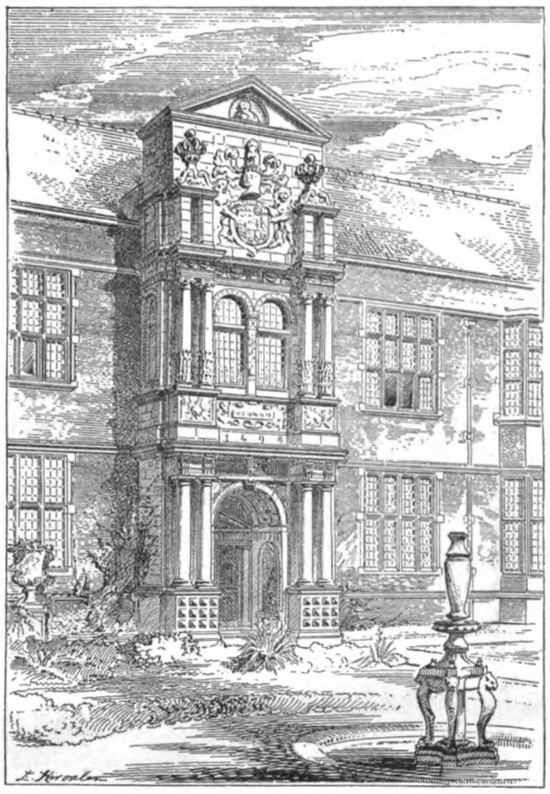


Fig. 4. Gravesend (Kent): Cobham Hall, Portal on the Court.

with strong and prominent projections; it is a souvenir of Milan or Venice; there is a complete surrender of this decorative "bit" to the art of the Italian sculptor-architects of the sixteenth century, who were the immediate precursors of decadence. Following the course temporarily adopted in France, at the beginning of the sixteenth century and down to the reign of Henri II, the local plan, the construction, and even the disposition of details, were kept intact, so far as they concerned the private life of an English family. To the foreign artist, called in as was the fashion, to the Italian, the Frenchman, or the Fleming, to the importer in a word, was entrusted the decoration and embellishment, but not the architectural system, not the general form of the monument. He received "bits" to treat in his own manner and according to his own understanding: express reservations being made in advance, under the indispensable guidance of the native master-workman, familiar with the national and local traditions which must be persistently maintained. It is for these reasons that we find battlements of the Tudor style and the Norman bow-window surmounting, at Oxford, a doorway which in France would belong to the latter part of the Renaissance.

John Thorpe, who is the best known of the architects of Queen Elizabeth's reign, and who crossed the channel to study the new architecture in Italy and France, erected a great many structures in England. About 1607 he built: Holland House (Middlesex), Bramshill (Hampshire), Summer-Hill (Kent), Charlton House (Wiltshire); and about 1611, Hatfield House (Hertfordshire). Lastly one of the most curious of English Renaissance edifices due to the capricious genius and picturesque fancy of this architect — the equal of our French masters of the castles of the Loire in the time of Francis I — is Wollaton House (1580–1616), which might properly be termed the English Chambord [See "English Architecture," Figure 38, *American Architect* for February 28, 1891].

The timber-work (Fig. 2), in the great hall at Wollaton, is quite typical of the so-called Elizabethan style: it is Tudor timber-work accommodated, in its curves and in the details of the superficial ornamentation, to the forms and taste of the Renaissance. The corbels, the pendants, the cornices with consoles and architrave, the filling-in of the spaces between the heavy parts, the very profiles of these parts — all is Renaissance, original and fantastic. But the main body of the architecture remains English.

After a lapse of sixty years, the English architect is seen following the course indicated in France, in the composite and picturesque works of the architects of Louis XII, or of François I, old French masters decking out, at command, their thoughts in the Italian mode.

Smithson had a part in the construction of Wollaton House, which was not completed until 1616.

About this time Inigo Jones, who was at first a landscape painter and then had become, during his travels in Italy, an enthusiastic advocate of the teachings of Palladio, returned to his country where he was received with favor by King James I and Queen Anne; he attempted, by putting into practice the precepts of the Italian master, to purify English taste; he copied the Italian Renaissance in England, allowing no regard for climatic conditions or for the usages of his country to interfere with the application of Classical theories. If he was not, in this way, always rational in his conceptions, he showed himself severe, a connoisseur in form and proportions, and skilled in the handling of orders imitated from the antique. In 1619, he began the Banqueting-house at Whitehall, London, a small part of a palace designed to be 1,152 feet long and 874 feet broad. At the centre of one side of the palace he planned an imitation of the superb disposition of the circular court in the palace of Caprarola (by Vignola); it was to have been 210 feet in diameter.

Inigo Jones, as is well-known, is considered a great master in England: he, moreover, founded a school. The cloister of Trinity College, at Cambridge (Fig. 3), has a gallery façade composed of orders with superimposed arcades, the architecture of which is Classical and of a most subdued style. François Mansart was not more correct in the so-called Gaston d'Orléans part of the Château de Blois, or in the door of the Hôtel de la Vrillère at Paris. Solomon Debrosses was not a more exact and judicious observer of the laws of proportion in the superimposed orders of the portal of Saint-Gervais at Paris. It is understood, of course, that in our comparison of the work of the English artist with these French productions no account is taken of the half-Tudor, half-Renaissance wing of the cloister.

We find, besides English, imitation of the French Renaissance in bits of architecture dating from the close of the sixteenth century. Does not the portal (Fig. 4) of Cobham Hall (Kent) constructed about 1594, and which seems to be brought here to occupy a bay seized from the austere façade of a Tudor



Fig. 5. Northamptonshire: Rushton Hall, Part of the Court.

manor, does it not recall, although remotely, that of Anet, now at the Paris École des Beaux-Arts? This imitation, or nearly that, of a masterpiece of Philibert Delorme and Jean Goujon supplies, however, the characteristic note of the English style

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of all times: a prominent display of gorgeous armorial bearings; their weight here crushes the proportion of the bay and portal which are nevertheless rustic.

To the pompousness of the pseudo-classic work we may be permitted to prefer the artlessness and tranquil unity of character, the more honestly rural style of Rushton Hall (Fig. 5), in Northamptonshire. Although dating from 1595, and notwithstanding the very questionable adaptation of balustrades that mask the gutter of the roofs, but suit well the gables of the great dormer-windows, it is in the Tudor style; it is *English*, merely disguised by its Italian ornamentation, the disguise seeming not to interfere in any way with the general structure or with the characteristic dispositions — great painted windows and bow-windows — answering climatic and national demands.



Fig. 6. Saint John's College (Cambridge): Flemish Gable (Tudor).

Elsewhere, moreover, and almost at the same period, a Tudor style is maintained, a style national but pure, at least in its silhouette. And if we except its profiles and numberless details it may be said that the architecture remains, at the close of the sixteenth century, what it was at the beginning. Only the merlons of the front walls and the crow-steps of the crest of the gables are transformed, as seen in St. John's College at Cambridge (Fig. 6), and show silhouette of the Dutch Renaissance type, — or possibly German. Rectilinear forms become curvilinear. Posts or finishing balusters, with four faces, recall the influence of an importation from a source far removed from the primitive home of the Renaissance. Italy counts for nothing in the exaggerated suppleness of these outlines, which remind one, though nearly always in a too commonplace way, of the picturesque architecture of the Low Countries [See *American Architect* for March 11, 1893, *et seq.*].

The works of the Frieslander Vredreman de Vries would

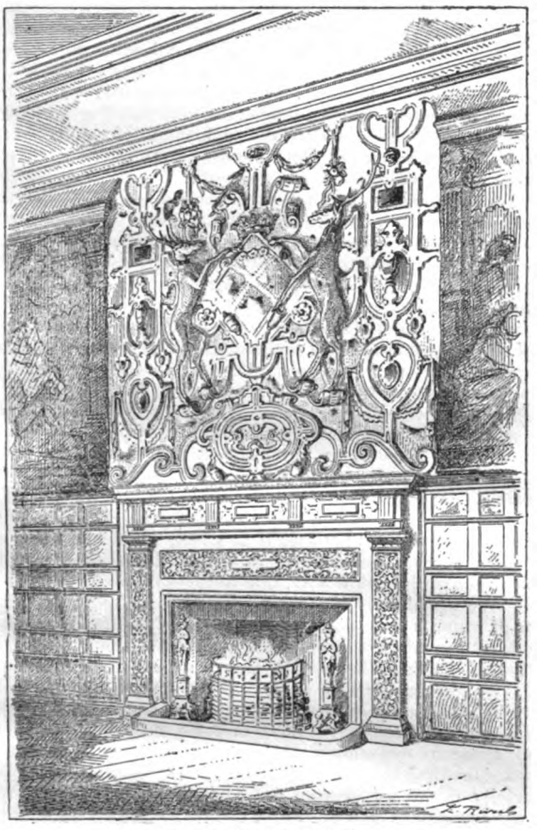


Fig. 7. Hardwicke Hall.

seem to have had much more influence on the English Renaissance as metamorphosed toward the close of the sixteenth century, than the decorative compositions of Holbein of Bâle could have had, in the middle of the same century. The commercial relations between London and the rich Hanseatic cities readily account for these influences.

However this may be, the English Renaissance cannot, as was the case in the corresponding transformation of monumental art in other European countries, be considered as an interesting period of national architecture.

In the interior decoration of English dwellings, Flemish or Dutch art appears without any question, as a single specimen of vertical decoration (Fig. 7) above a fireplace in Hardwicke Hall suffices to show; however, a purely English tone is given to the composition by the proud expansiveness of the cumbersome heraldic motive. It is very characteristic, but this frank display of family pride has its greatness and its peculiar nobility; it is not commonplace. All the rest is from a Flemish master of the latter part of the sixteenth century. This typical example perfectly illustrates the decorative manner adopted from mediæval times for the grand fireplaces of the halls or galleries in the manors of old England.

From the ceiling of a gallery (Fig. 8) of St. John's College, Cambridge (1589), one can likewise get an adequate idea of the general plan followed at the time in question, in the lattice-work decoration of the ceilings or vaults over the large rooms of private houses [See "English Architecture," Figure 37, *American Architect* for February 28, 1891]. It is, as it

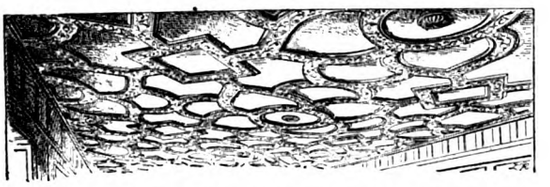


Fig. 8. Ceiling of the Gallery at Saint John's College (Cambridge).

were, an indirect copy of the ceilings of Serlio, whose writings and compositions were first introduced into Flanders through the translation of the painter, Van Aelst (1545), and formed a school, helping on the Flemish Renaissance, the very original works of which were, later, to find an imitative echo in Germany and even in England. E. RIVOALEN.

THE NINTH LEAGUE EXHIBITION. — I.

THE Ninth League Exhibition differs from its predecessors mainly, at first view, in having a more colored effect. Undoubtedly, this is due, for the most part, to the great number of decorative paintings, designs for stained-glass and mosaic, and other things of the kind, which form a very large portion of the exhibition, and to the richly decorated room, with its three great banners of red silk, in which the architectural drawings proper are hung; but, making allowance for all this, it seems to us that the proportion of colored drawings is, this year, greater than it has ever been before. Whether we are to see in this a change in the practice of architects with regard to their competition, or other show-drawings, or the result of the closer intimacy between the arts of painting and architecture which the Fine Art Society has cultivated, we will not undertake to say, but the fact is worthy of notice. Moreover, it seems to us that not only are the colored drawings more numerous, constituting more than half of those hung in the more strictly architectural part of the exhibition, but that they are better than ever before. What may be called the commercial colored perspectives, about which there is a similarity from year to year, are at least as good as usual, but there are fewer unsuccessful attempts at large colored drawings by inexperienced hands; and the sketches from nature are, as a rule, larger, and better and more carefully done than in any previous exhibition.

On examining the catalogue, as a preliminary to beginning our tour around the rooms, we find that the exhibition differs also in another respect from the previous ones, in containing fewer works from contributors outside of New York. The fine perspective drawings from Chicago, which once formed an important part of the show, are wholly wanting, and the pretty water-colors which we had been in the habit of expecting from Mr. Emerson, Mr. Peabody and Mr. Rotch, of Boston, and the fine Philadelphia work in black-and-white, are all conspicuous by their absence. However, the New York people manage to fill their walls very agreeably without them, and, except for the advantage of having the exhibition more representative of the work of the whole country, the League might exclude all contributors outside their own membership, without fearing that their annual show would be unattractive.

Beginning, as we usually do, at the beginning, we find the first twenty-two numbers represented by as many magnificent carbon enlargements, three feet by four, contributed by Mr. Frank Hegger, and offered for sale, at thirty dollars each, which certainly does not

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seem dear. The subjects are all architectural, including a variety varying from the façade of Amiens Cathedral to the interior of St. Mark's at Venice, and are, presumably, selected from a much larger number.

No. 23, the first of the architectural drawings properly so-called, shows the new building of the Manhattan Life Insurance Company, on Broadway, by Messrs. Kimball & Thompson, in a well-colored drawing by Mr. Hughson Hawley, which is supplemented by a model, something like eight feet high, in the middle of the room. The design is probably familiar to our readers, and is shown to great advantage, both in the model and the colored perspective. Next to this come some sketches in water-color, by Mr. Herts, and Mr. Brunner, whose work is always pleasing, and Mr. Everett K. Taylor, who exhibited a few small sketches last year, but is this year one of the most important contributors in this line, showing some very charming work.

In No. 27, we are introduced to the first example of a class of design which has attained in this year's exhibition a marvellous development — that of brick and half-timber work. Whether the New York public has gone mad over brick and half-timber, or the hanging-committee only has been seized with the mania, we cannot say, but nearly every dwelling-house design shown is in this style, and it appears in designs for many structures of other sorts. It is needless to remark that the evidence, in so important an exhibition as this, of such unanimity in the choice of a style hitherto not much employed, gives rise to grave thoughts in the mind of the visiting architect. Can it be that the Colonial clapboard is about to vanish before the fifteenth and sixteenth century brick and plaster? If so, every architect who values his business prospects should make early preparations for the change; for the fate of the dressmaker who is not on the alert to notice when gigots give place to bretelles is not more dreadful than that of the designer of houses who fails to know everything about the very latest style in "mansions" and "cottages."

No. 28 is a very pretty design for a school-house in Brookline, by Mr. William Atkinson, quiet and elegant, and shown in a sepia drawing, so finished and skilful that we mistook it at a distance for a large brown-toned photograph of a real building. Next to this comes another house, with brick in the first story, and half-timber above, by Mr. J. G. Thorp, which is particularly pretty. Notwithstanding our New England affection for the old-time elegance of wooden pilasters and dentilled cornices, we are by no means incapable of appreciating the beauties of half-timber gables and carved barge-boards; and Mr. Thorp's design, taken in connection with its numerous relatives to be seen upon the walls, gives promise of a revival of the picturesque in American domestic architecture, which may lead to great things. Next come some designs for banks, by Messrs. Le Brun & Son, and Mr. Warren R. Briggs, which do not appeal very strongly to our sensibilities, and probably were not intended to do so; and a design for a Museum of Art for the City of Providence, which might, so far as the subject is concerned, have been appropriately made much more beautiful than it is. Two large designs for the Brooklyn Institute of Arts and Sciences follow, one by Messrs. Brockway & Benson, showing a good design, well rendered in India ink wash; and the other, the accepted one, by Messrs. McKim, Mead & White, indicating, so far as can be seen by the perspective, a clear, symmetrical plan, carried out in a massive, colonnaded design, coarsely rendered in color, and having a chalky, disagreeable look. This drawing, which is by Mr. Hoppin, and has the air of having been colored in about four hours, hangs next to a pretty water-color sketch of a Venetian palace, by the same clever artist; and next to this, again is another colored sketch of another Venetian house by Mr. J. Watrous Case. It was an unfortunate idea to hang Mr. Hoppin's and Mr. Case's drawings together, for Mr. Case's impression of Venice seems to combine that of Diaz and Turner, and his rich, sunshiny coloring makes that of Mr. Hoppin, who probably had rainy weather during his stay in Venice, look rather cold; and the same mistake is repeated a little further on, where a good and careful drawing of the Casa d'Oro, by Mr. Hoppin, is hung next to a beautiful little picture of Santa Maria della Salute, by Mr. Case, as pretty and warm in color as it is artistic in its treatment of the subject.

At this point we bid farewell for a while to Venice and the artistic and poetic, and have presented to us some designs for boarding-schools, of no extraordinary interest, and an iron rood-screen, by Messrs. McKim, Mead & White, which suggests a garden fence as much as anything, but has some stylish-looking tops to the pickets, which undoubtedly raise it well into the realm of high art. Next, after another brick and half-timber house, by Messrs. Stephenson & Greene, comes a pencil-sketch for an Episcopal church, in San Francisco, by Messrs. Coxhead, which comes near being very successful; and we then reach one of the best things in the exhibition, — a colored elevation, by Messrs. Romeyn & Stever, for the exhibition building of the American Institute. As a drawing, a colored elevation is never of great interest, but, as a design, the present subject is one of the cleverest adaptations of Dutch brick and stone architecture we have ever seen. Few people know how beautiful the brick and stone work of the best period in the old Dutch cities is, but Messrs. Romeyn & Stever have not only caught the spirit of the best examples, but have adapted the style most artistically to difficult conditions. There is another Dutch gabled design, in brick and stone, farther on, but it is less carefully studied, and has the fatal mistake of being rendered in yellow brick, so that it loses the warm, comfortable color, and the contrast of the brick and stone, which are essential parts of the impression peculiar to the style.

Hereabout, we come to some photographs of Mr. Kimball's theatres, which, notwithstanding the interest of their subjects, count as dark, unpleasant spots among the bright drawings. It would be a pity to discourage contributors from showing photographs of their works, and some things can only be properly shown in that way; but it would be very much for the advantage of the exhibitors to have the photographs collected in a room by themselves, where they would neither injure the effect of the drawings, nor be injured by them.

The east side of the Vanderbilt room is, to a considerable extent, taken up by a set of large drawings, mostly in pencil, with a little color on the cut surfaces, of the enormous house which Mr. Post is building for Mr. Cornelius Vanderbilt. The "lay-out" of the house, if we can apply so familiar a term to anything so fine, is magnificent. Nothing of the kind, we think, has ever been attempted in New York, and one would have to turn to Bridgewater House, or some other London palace, for an adequate comparison. The interior decoration, as indicated on Mr. Post's sections, is, perhaps, more elaborate than in the London houses, and there is a certain picturesqueness in the arrangement, and changes of height in the ceilings, which promises a charming effect in execution.

[To be continued.]

ELECTRICAL SCIENCE FOR ARCHITECTS. — I.

ONE hears very often that this is an age of specialists. We are told time and again that all one's thought and endeavor must be given to one branch of work, if there is to be any advancement. Yet it seems quite as true that there has never been a time when one must have so broad a knowledge. The development on all lines has been so great, and, in all branches of engineering, at least, these lines have become so interwoven that one must greatly broaden interests and knowledge if the most is to be made of the special work. We may know only one thing, but we have to *know about* a great many.

Electrical engineering and architecture are certainly distinct, yet electrical matters are every year brought more to the architect's attention. Electric-lighting, the increasing application of the motor to elevators, pumps, ventilating-fans, etc., and the innumerable bells, burglar-alarms, gas-lighting arrangements and similar conveniences, have a rather important place in the fittings of buildings, and the electrical item is one of too much consequence to be turned over *carte blanche* to contractors or arranged for without due consideration. It is becoming important that the architect should know a little about the nature of electricity — the uses it can be put to, and what safe, economical, and durable electrical work is. Electrical power can be so cheaply and conveniently brought into buildings of any size that there is no limit to its possible use. Already it is being seriously considered in connection with heating and cooking and if the hopes of inventors are realized, the need for providing for the use of electricity and for looking most carefully into all electrical arrangements will grow into a necessity.

There seems to be an inclination to look upon all electrical matters as quite out of the range of ordinary work and interests, perhaps as something too mysterious to comprehend without that thorough study for which there is not time. But every architect knows something about plumbing, steam-heating and gas, and the necessary knowledge about electrical matters is scarcely more occult. It would be a much simpler matter if we but had an "electrical sense." Most of the actions take place without giving any evidence that can be appreciated by our five senses. When a wire is tapped here and there and a part of the electrical energy is translated into some other form that we recognize, such as light and heat, it seems an unreasonable and miraculous thing, for with our limited perceptions we cannot follow from cause to effect. A little familiarity with the phenomena is acquired, and we are apt to forget the miraculous part just as we do on seeing an object drop toward the earth. We become content to simply give a name to the force. It seems to bring electricity nearer when it is thought how little we should know about heat if there were no sense of feeling. A good deal could be learned about it of course in a slow way, but its actions would be very mysterious. We would, perhaps, see a piece of wood suddenly blaze up, a kettle of water a foot above it would begin to dance about and boil, and yet we might pass our hands between them with no appreciation of anything happening there. Steam might be carried from a closed kettle through a pipe to a small engine. The pipe might be of glass and nothing would be seen, so if we had no sense of feeling we would see only a piece of wood blazing and a machine, with no apparent connection, doing work. It would surely not be less mysterious than the working of an electric motor.

Electricity is not an erratic, uncertain thing. The laws which govern its actions are well known, it can be controlled without great trouble, electrical forces can be measured with the greatest accuracy, and the way in which it will act under given conditions can be foretold with definiteness. Whatever it really is and whatever may ultimately be found true as regards its nature, it is known that it acts very much as a fluid does, and all the actions of water flowing in a pipe are closely analogous to electricity "flowing" in a wire. We cannot go very far wrong if we look upon it in this way, and as

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water flowing in a pipe is such a familiar phenomenon, a great number of useful analogies are at hand, and an easy way is open of understanding many of the actions of effective currents.

In the earlier days of electricity, when trained workmen were scarce and the needs not so well understood, and when, it might be added, the underwriters were not so hard upon the heels of the contractors, there was a great deal of exceedingly poor and slipshod work done. Electricity was fast getting the reputation of being a most untrustworthy servant, if not one actually dangerous to property. This idea is being dispelled under the improved conditions, and while much bad work is still done, and most of the wiring is far from perfect, it still has been proved that even in the most difficult places electricity can be employed with the greatest surety of action and freedom from danger. The underwriters have done much to bring about the improved state of affairs, for surety of action and freedom from fire causation are very closely related.

Faulty circuits are not always easily discovered, for there is often no sensible evidence of defects until they are looked for with great painstaking or until they suddenly become worse and give sensational notice of fault. It is consequently of great importance that the work be done thoroughly to begin with. It is not a difficult matter to confine electricity to its proper conductor, but to do so it is absolutely necessary that every care be taken with the insulation. With all metals such good conductors, and with brickwork, plaster and damp wood partial conductors, there is a great temptation for the current to go astray.

There is this difference between electricity and water. Water flows freely in space and to conduct it we surround a certain amount of space with metal — we use a pipe. The metal is the insulator through which the water cannot pass unless the metal be punctured. Electricity does not flow freely in space but does through metals. Space is the impassable and the metal is the "hole." When wires are strung, it may be considered as punching holes for the electricity to flow in, and if these "holes" are not surrounded by some non-conductor, it is of course impossible to keep the electricity in the path intended for it. Pipes are strengthened and joints are looked after with regard to the pressure upon them. Electrical insulation should also be looked after with regard to the pressure which it is to withstand, for there is an electro-motive force that is analogous to water-pressure. In insulating wires the difficulty comes from the fact that all electric insulators can be either punctured or permeated by conductors. Sometimes they even become themselves partial conductors through the action of heat or other deteriorating agents, and it is necessary to provide against all of these conditions in one way or another. If a nail pierces the insulation, if dampness permeates it, or if it becomes charred by heat there may be a leakage. It is as if a water-system were tapped by a small pipe through which the water constantly leaked away, only it is a far more subtle waste and attracts no attention unless there be on account of it a lack of power in the circuit. And it is by no means the waste alone that makes leaks undesirable. There is a very small margin often between a small leak and a great one, and if it is large it carries off practically all of the electricity, leaving nothing for useful purposes, and in doing so is very apt to cause a part of the circuit to heat to a dangerously high temperature.

But even in damp cellars, tunnels and mines, electric circuits are in successful operation. A few principles must be kept in mind, a few rules carefully followed, but if proper attention is given to insulation, leaks will be impossible under normal conditions.

RUSSELL ROBB.

(To be continued.)

ARCHITECTURE AND ADVERTISEMENTS.[1]

IF we transport ourselves — calling historic imagination to our aid — to the time when an earlier race of members of your Corporation entered into possession of this beautiful fabric, we can realize that in those days, happier in some respects, less happy in others, the problem was wholly to enlarge the supply of what was beautiful or comely. The ordinary architecture of the last century possibly left much to be desired. And as we know to our cost there was a sad want of sensibility to the charms of the older work, and a stalwart contempt for what, in these days, we should consider picturesque effect in domestic buildings. Comfort was studied to the neglect of grace. Speaking as I do in a district which commemorates by its very name the fame of the two brothers who played so prominent a part in reconciling beauty of form with rigid regard for homely utility, I ought perhaps to hesitate about accusing their age of any conscious tolerance of ungainliness. Many of the public edifices of the time attest a striving after the fanciful, although to our eyes the result did not always respond to the excellence of the intention. But if we confess, as I fear we must, that there were periods in which grace was little sought and seldom found, there was a redeeming absence of deliberate disfigurement. A street might consist of long rows of uniform brick houses, in which the only thought of the designer was to arrange for windows that would admit the light, and doors that would allow free exit and entry. . . .

Are we proving ourselves worthy of the inheritance to which we have succeeded? Are we faithful trustees of the relics that have been left to us by our ancestors, and that we are bound in honor to hand on to posterity? A journey on foot in any direction whatever from the Bank of England, or any other centre, east, or west, or central, will supply the melancholy and humiliating answer. Would Dr. Johnson, if he were with us still, dream of inviting his friends to take a walk down Fleet Street? Would Charles Lamb protest that there was no such scenery anywhere as could be had without leaving town? Would Robert Herrick, hurrying up from his pleasant Devonshire parish, vow that now at last he could live again, since he was back in London? Need I attempt here to draw a picture of what greets the eye, say, in that part of Holburn which lies between Tottenham-Court road and Holburn viaduct? or to present a verbal photograph of the panorama of placards which surround that most beautiful of churches, St. Mary-le-Strand. Have any members of the Society of Arts been lately to Tower-hill? If they have, they will not ask to be reminded of what they saw. If they have not, far be it from me to counsel them to purchase so dearly experience of what crimes can be committed in the name of trade.

I confine myself — for the sake of practical illustration — in detail to a survey of the Thames Embankment. There, the process of creeping disfigurement can be watched almost from day to day, and its effect studied by reference to what remains of the original beauty. We all of us, as rate payers, have excellent reason to know that it cost some millions of public money to create that superb avenue; for superb it is, in the majestic sweep of its spaces, and in the massive grace of the chiselled granite that forms the rampart. Yet much as we must praise the completed work, we must not refuse to confess that there was loss as well as gain. The river banks, a generation since, were unquestionably picturesque. The fleets of lazy barges moored in the stream or floating sluggishly with the tide, the motley host of minor craft, made the water thoroughfare, as seen from any of the bridges, a sight full of suggestion and beauty. At high tide there was the bright sheet of water, at low the shelving mud banks, features not lovely in themselves and undoubtedly malodorous; but as part of the scene, full of artistic merit. Then there were the bridges themselves: the spectator, let us hope being so placed as to have in the foreground that masterpiece of bridge-building which commemorates the most glorious event of English history. Forming part of the same group would be Somerset House, descending in its imposing terraces to the water's edge, while as background would be the mighty dome of St. Paul's and the countless spires and roof-ridges of the city. As to the buildings by the river's edge, I am not afraid to take up my parable in their praise. The two shot-towers were and remain — to my eyes — objects as stately and, in their way, as fine as any minaret on the Golden Horn or campanile on the Grand Canal. Then there were the wharves with their huge mills and graneries and stores, and all the miscellaneous relics of shanties, black with time, sheds that tiled roofs made gracious, decrepit old houses, edifices more modern, but not offensive, simply because they served appropriately a distinctly useful end. Add to all the infinite mutations of sky which our climate, with fickle prodigality, gives us; whether the rolling mist and brooding smoke-clouds, or the ungenial clearness of the East wind, and we need not wonder that the master-painters of Great Britain have found in the Thames, above bridge and below, constant subjects for their most successful canvases.

I am far from saying that the charm has wholly departed even now. But there has been change enough to impair, if not to destroy the grace: to mar the enjoyment of the whole, even if still much material for artistic contemplation of detail can be found by that happy class of seeker, who can tolerate the vexations that come in the way of delight.

I want, by your leave, to consider the character of these changes, and to discriminate between those that every man of sense, whatever his æsthetic sensibilities may be, must accept as unavoidable and even praiseworthy, from those which are purely wanton and gratuitous — which disgrace civilization instead of being the result of progress; and which not only call for the censure of all intelligent believers in the principle of public utility, but are susceptible of remedy.

There is, to begin with, the construction of the Embankment itself — an undertaking which made a clean sweep of what I may venture to call the picturesque higgledy-piggledy on the Middlesex side, and substituted for it an imposing regularity. If the only thing to be considered were the desirability of providing for some elegant loiterer on one of the bridges a pleasing picture for sunrise or sunset, the decision would possibly be in favor of leaving things as they were before Sir Joseph Bazalgette waved his engineering wand over the scene. But, of course, pictorial interest is not the criterion. Cities exist to satisfy the everyday needs of the average population, not to nourish the dreams of the poet nor refresh the eyes of the landscape lover. Convenience, then, in the broad and common sense of the word, is the primary point to be considered. There was urgent need of a new line for the traffic of the metropolis; something was to be said for the view that the river which flows through the greatest city of the world ought to be flanked by massive and sumptuous edifices; many, even those who thought that the stream as it was, was fair enough, were forced to acknowledge that a promenade from which people could watch the water was needed to extend the range of general enjoyment; and public order, too, demanded the reconstruction of an area in which there was much

[1] Extracts from a paper read by Mr. Richardson Evans before the Society of Arts, and published in the *Journal* of the Society.

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that shocked the sanitarian and added to the anxieties of the magistrate. The construction of the Embankment, therefore, was good work, well done. . . .

I return to the platitude: Cities do not exist for the sake of being picturesque. Facilities for manufactures, for commerce, for trade, for ease of traffic, efficiency of sanitation, and police administration: these are the things that influence the plans of our municipal ædiles. But though cities do not exist for the sake of picturesque effect, picturesqueness may be, and ought to be, an incident of city life. The other utilities I have mentioned may be reconciled to this utility; and the arrangements made for securing scope for industry, safety for life and limb, and, generally speaking, physical convenience, should be consistent with, and conditioned by, arrangements for giving fair play to the tendencies which make for the comfort of the seeing eye. . . .

When the Thames Embankment was made, care should have been taken to save from unnecessary disfigurement the scene of which it is a feature. No care has been taken. Everything has been left to chance, and chance means the caprice of the individual defacer.

Presently I shall ask you to apportion responsibility. Here let me seek to portray — in sorrow rather than in anger — the result of official neglect and private competition in the senseless effort to catch the eye. Nearly a generation has passed since the roadway and the newly-created building space adjoining became an accomplished fact. Many of these places still remain areas which it would be a compliment to call a howling wilderness. It may be a matter for just complaint that those who had the letting of the sites were so long in coming to terms with those who wanted them; but that is a matter for business criticism. I may not enter into it here, and am willing to assume that all was done with a strict regard to the pecuniary interests of the public. But I do say that it showed a very grave insensibility to the principles of civilization in any rational sense, that the vacant sites have during all these years been allowed to remain, not merely as an eyesore, but as a nuisance to the neighborhood. It surely would have been possible to have enclosed them with a decent paling, to have kept that decent paling in a decent condition, and to have kept the land as a sort of field, which, pending the long-deferred signing of the leases, would have added to the health and comfort of the neighborhood. But all the intelligent enterprise of the eminent persons concerned appears to have spent itself in making a costly embankment. To spend a small sum yearly for the purpose of making the outlay remunerative, in promoting the ends which were supposed to justify it, seems never to have entered into the collective minds of these municipal worthies. Every building, as it successively rose from the waste, was allowed to add something positive to the aggressive meanness of the spectacle. The gable end of a new structure in one of the lateral streets, just because it was huge and ungainly, and by its obtrusive bulk thrust itself upon the eye of the pedestrian, was utilized by the occupant as a colossal tablet to announce to people half-a-mile away the nature of the business that was being prosecuted inside. No doubt each tenant would plead that he was only taking advantage of a temporary chance of advertising his business, but the net result is, that the Thames Valley in this region has become a permanent hoarding on a gigantic scale, without even any alleviating variety in the character of the inscriptions.

Nor was there any relief or prospect of relief, as the structures rose which were to form the permanent frontage. I am not one of those who seek to acquire a reputation for refined taste by sneering at the works of modern architects. I believe that contemporary builders are not inferior to their masters and forerunners, and I have no grievance against those who severally designed the works that the intelligent foreigner may study from Waterloo Bridge. But can any one say, surveying the series as a whole, that it is worthy of the superb situation. Uniformity is not beauty; but there is a degree of contempt for congruity that approaches deliberate unsightlessness. I do not think that it should have been left to pure chance whether a Queen Anne's pile in red brick should overtop a Palladian façade in Portland stone, yet I own I should not murmur if each item in the architectural miscellany were left such as the designer intended it to be. Irregularity and variety are, it must be considered, part and parcel of that sturdy individualism which is still associated with the type of the true Briton. But it is impossible to approve a system of *laissez faire*, which allows the manager of a great hotel, built with a robust disregard for dignity of appearance, to crown his offence and his establishment with an enormous board, which proclaims to thousands who do not care for the information the uses to which the building is applied; nor can any one who dislikes strong language trust himself to speak in adequate terms of the decision of a very learned college, which adjoins Somerset House, to destroy, by the erection of an elevated laboratory, the exquisite perfection of a façade which is a national possession and ought to be an object of national pride and reverence.

When the people who do these things are put on their defence, they generally fall back, by way of extenuating their own sins, on the colossal enormity of the Charing-cross Railway station and bridge. "What is the use," they say, "of being nice about trifles, when this monstrous iniquity is allowed?" It is the old, old story. Because things are bad it is not wrong to make them worse. Because there has been negligence once, close the door for ever on precaution. Let me not be misunderstood. It was absolutely necessary that there should be railway bridges over the Thames; and I for one do not think the one which we owe to the South-Eastern Railway at all a bad specimen of its kind. It has strength and massiveness. There is no sham about it. It is what it pretends to be: a fine piece of engineering in iron work. The Rialto is more romantic; but a Rialto is not what London needs, and there is a homely grandeur about this viaduct of girders. Wordsworth, had he lived to see it, might have found as much to quicken his poetic sense in this constant procession of trains laden with their freight of men and women, full of human emotions and anxieties, as he did in the contemplation of the sleeping city from the old bridge of Westminster. Humanity has not ceased to be pathetic because it is often packed uncomfortably in third-class compartments, and has to make undignified haste to catch a train. Turner, who lived long enough to grasp the poetry of steam, would certainly have found much to paint in that never-ceasing picture of the panting, toiling locomotive monsters. I say, then, that Charing-cross Railway bridge does not necessarily or irretrievably spoil the picturesque or jar upon the sentimental mood. Of the station itself we dare not speak with the same charity. Even had the architect tried to make it an ornament to the river-side, he would have been baffled by the intrinsic difficulties. But, as a matter-of-fact, he was not instructed to try; and it remains probably a unique sample of a mammoth shed — a thing without form and void. Something might even now be done to make the staring chasm a little less aggressive; but in any case, though the unwieldly bulk of the thing must more or less upset the balance of the prospect, there is an impressiveness about it which may almost reconcile us to the want of grace and harmony. One is sorry that it is there, but there it is; we must accept its presence.

But what we cannot and ought not to tolerate is the pretension of the directors to make profit out of the wrong they have done. It is nothing short of a public scandal that they should use the walls — such as they are — for advertising stations, and that they should plaster their staring posters on that part of their bridge which spans the Embankment. We must put up with their ironwork; it is outrageous to affront us with their bills. . . .

These, however, are, comparatively speaking, bagatelles. The main charm of the promenade would, in a healthy condition of things, be the view of the river in its devious course. But alas for the poor pilgrim who seeks the old delight. Some purveyor of advertising appliances bethought him that if colossal gridirons could be erected on the roof-ridges, huge letters could be hung on them which would show against the sky; and so trader after trader, thinking only of the chance of snatching a penny from his decent competitors, gave his orders, and lo, there was an end of the firmament, and, as it seemed, of architecture. The County Council, to their very great credit, would not stand this. But it is a proof of the want of moral courage which dooms us to the sorrows I speak of, that though the motive was, unquestionably, regard for the eye, no alderman or councillor nerved himself to recommend prohibition on this ground. By a legal fiction the things have been forbidden, on the transparent pretext that, if they fell, they might hurt some one in the street below. And, as we have saddest reasons to know, the frames that were already in possession of the sky, were allowed some years of grace — or rather some years of hideousness. By a later Act an attempt was made to bring other elevated advertisements under the ban, but concessions had to be made which, as far as my observation goes, has rather stimulated the production of Gargantuan signboards. . . .

We are told unceasingly that it is the spirit of competition that is the root of the evil; but this explanation — I say it with all deference to the eminent philosophers who are all agreed to give this account of the matter — is unscientific and inadequate. The population of these islands no doubt consists of about 40,000,000 of people, all more or less concerned in making things pleasant for themselves; and publicity, let me most freely grant, is, in business matters, a cause of profit. But there are two ways of securing prominence. You may advertise yourself, but if other people do the same, you have advertised in vain. Conversely, you may keep your own place in the public eye, by preventing your neighbors from usurping more than their share. Therefore, though the desire to secure prominence is the motive which leads each individual to push himself forward, it does not at all follow that society, as a whole, has any interest in the appeal to the retina. If the opportunities of display be limited all round, no one will be the loser; indeed, there will be an aggregate gain, since all the expenditure of effort that is now wasted — and worse than wasted — in manufacturing catchpenny-emblems of all sorts, will be available for purposes really useful to the community.

DANGEROUS OCCUPATIONS.

THE present Home Secretary, the Right Hon. H. H. Asquith, has turned his attention to the question of dangerous occupations, and within the past few days two reports of department committees have been issued regarding them, on "Various Lead Industries," and on "Potteries" respectively. The former is the more important of the two, as the industries in question are notoriously dangerous, particularly that dealing with the manufacture of white lead. For some time past much has, however, been done to render it less

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noxious to the workpeople by the issue of rules which require the employers to provide overalls and respirators for use in certain processes, and also accommodation for washing and bathing. The employer is required to see that the workpeople wash faces and hands before each meal-time, and take a weekly bath. He has to provide all necessary appliances for these purposes, and insist on their use. By these means the constant absorption of lead through the skin is greatly reduced; the overalls prevent the clothes becoming fouled, while the cleansing prevents lead particles being carried into food, or accumulated under the nails and in the pores of the skin. To minimize the absorption of lead-dust, the plates of lead-carbonate are required to be wetted before they are removed from the "white beds," and again at the crushing mills. But in spite of these precautions much dust is created. That this is so will be understood from a description of the process of manufacture. Gratings or thin plates of metallic-lead are made into stacks within a brick cell. This is done as follows: The floor of the stack is first covered with a layer of tan; on this are arranged as closely as possible stoneware pots filled with dilute acetic acid, and on the top of these are placed four or five layers of lead-plate. The whole is covered over with boards, forming a second floor, upon which fresh layers of tan, pots and plates are arranged. This is in its turn covered in the same way, and so on until the stack is full, as many as ten or more layers going into one stack. When it is complete, it is closed and left ten to fifteen weeks; the tan heats and evolves carbonic acid, the heat volatilizing the acetic acid. Chemical action between the lead, the carbonic acid, the acetic acid, and the air takes place, leading through a series of changes not clearly understood to the ultimate production of an amorphous basic carbonate of lead, or white lead. When the process is supposed to be complete, the stack is opened and taken to pieces. The corroded lead-plates are carried in trays, generally by women, to corrugated-rollers, over which there passes a constant stream of water. In front of these rollers the corroded-lead is tipped, after being dipped in water or thoroughly wetted by a hose, otherwise much dust arises, and even this does not entirely prevent it. In passing through the rollers the white lead is separated from any remaining blue or metallic lead. The crushed material next passes into a shallow tank, having a perforated bottom, in which it is raked about, completing the separation. The blue lead is raked out, and the white lead passes with the current of water to grinding-mills, where it is ground-up and run into a series of washing tanks or becks. Here the lead settles, and the water is run off; the white lead is then removed, put into earthenware or copper pans, and placed in drying-ovens. There it remains from three to five days; the pans are taken from the ovens by hand labor, and the dry white lead is either packed directly in casks or thrown into bins for subsequent conversion into paint. The emptying of the ovens and the packing of the white lead is necessarily a very dusty operation, since the white lead, being perfectly dry and friable, rises readily as dust.

Such is the general outline of the process. The chief danger arises from the inhalation of the dust, which is carried directly into the lungs, and also by the saliva into the stomach. There is also danger from absorption through the skin, and by particles being dropped into food from the hands. These two latter are fairly provided against by the present regulations, and it is to the former that the committee directed their principal attention. They found, by inquiring of the medical officers connected with the various works, that women are more susceptible to lead-poisoning than men, and young girls than full-grown women. It is well known that lead is capricious in its action on the human constitution, and that while some can resist its effects almost perfectly, others succumb very readily. From the evidence taken it would appear that a strong organization is the best defence, and that consequently the weaker sex are the chief sufferers. As it is impossible to predict what will be the effect of the absorption of lead on a given person, the committee have taken the bold course of recommending that no female labor be permitted after January 1, 1896, in the white beds, the rollers, the wash becks, the stoves, or in packing dry white lead. Practically this covers the entire manufacture, and, if the recommendation be adopted, must have very serious consequences on the trade.

It is little less than a revolution to prohibit women working at a manufacture that has hitherto been carried on almost entirely by them. It means either that higher-priced male labor must be employed, or that machinery must be adopted as far as possible. Engineers are not likely to grumble at this latter alternative; at some of the best organized works many of the processes are conducted by automatic-mechanism, and in all machinery might be adopted to a greater extent than it is. It shows how crude processes survive when labor is cheap and ignorant when we relate that, in forming the stacks, in some works women carry on their heads plates of lead, varying from thirty pounds to fifty pounds, up ladders ten feet to fifteen feet high. At others, women cast these plates from the molten lead. Evidently the owners need some pressure brought to bear upon them in order to enable them to recognize that they live at the close of the nineteenth century, and to see that not only is it indecent to allow ignorant women to continue in such tasks, but also that it is uneconomical. The disinclination that we should otherwise feel in concurring in the recommendation to abolish female labor at two years' notice is a good deal reduced by the knowledge that it is now used, in part, for such unnecessary purposes.

From time to time processes for the manufacture of white lead in a perfectly innocuous manner have been placed before the public, and some of these are now at work, but their output is, relatively, so small that the committee pass them over in a few words. Foreign competition in white lead is so severe that regulations demanding a radical change in its method of manufacture would kill the home industry entirely. Besides white lead, there is manufactured sulphate of lead, red lead, orange lead, litharge and yellow lead. None of these latter are so poisonous as white lead, and beyond general recommendations concerning ventilation and personal cleanliness the committee have little to suggest.

The Potteries Committee of Inquiry found that the chief evil they had to deal with was the dust of clay and flint. These have a serious effect on the health of the workers, setting up inflammatory action in the lungs, and ending in gradual consolidation and abolition of the functions of the organs. Analysis of the mortality returns for males above the age of fourteen for the year 1890, of the Parish of Stoke-on-Trent, including the county borough of Hanley, the boroughs of Longton and Stoke, and the large town of Fenton, show that, of the total mortality from all causes among potters, bronchitis accounted for forty-two per cent, pneumonia and pleurisy eight per cent and pulmonary consumption twenty-one per cent. Thus seventy-one per cent of the deaths arose from chest disease. Among pressers, bronchitis was the cause of death in forty-seven per cent of the cases, and other lung diseases in seven per cent; pulmonary consumption accounted for twenty-one per cent. In this class, therefore, seventy-five per cent die from chest diseases. In males above fourteen, living in the district, but not engaged in pottery labor, diseases of the chest produced twenty-six per cent, and pulmonary consumption fourteen per cent of the deaths. The dust is not directly poisonous, in the ordinary sense of the word, but it is so deleterious that the average length of life among potters is forty-eight years, while among non-potters in the district it is fifty-three years. It is evidently impossible to abolish clay and flint in the pottery trades, or to prohibit adult male labor, and therefore the committee could only insist on improved ventilation and greater cleanliness.

Lead-poisoning also occurs in the potteries from the glazes employed, and is especially liable to attack young women and lads, especially if they are ill-fed or debilitated. The bad effects of the lead are, however, being gradually reduced, as shown by the statistics of the hospitals and the experience of medical men. This is probably due to greater personal cleanliness, to an improved standard of living, and possibly to increased intelligence among the workers. The committee suggest that in future no child under fourteen be employed in the dipping-house or the dippers' drying-room, or in any process of ware-cleaning after the dippers, glost-placing, china-scouring, ground-laying, or majolica-painting, or in any process in which lead is used. Overalls and head-coverings are to be provided for all workers exposed to lead dust; no food is to be eaten in a room in which lead is employed; efficient ventilation and daily cleansing are to be provided for; washing appliances are to be supplied; excessive temperature in the workshops is to be avoided, and no female under sixteen years of age is to be employed at treading the lathes used by turners.

These recommendations are much less drastic than those propounded by the Committee on Lead Industries, the danger to be met being less imminent. They amount to little more than common-sense suggestions that any humane employer would wish to carry out. It is evident, however, from the tone of the report, that greater opposition is to be expected from the workpeople than from the employers. Dust is preferred to draughts, overalls are found to be irksome to work in, scrupulous cleanliness involves more trouble than workpeople often care to take, and in many ways the proposed reforms will provoke opposition. The position of an employer thus becomes very unpleasant. He is urged to spend money and thought for the benefit of his workpeople, and he finds his efforts resisted by the very persons who reap the gain of it. He must console himself by the reflection that were it not for this want of thought — this preference of present ease to future well-being — he would find it difficult to obtain hands, and would have to pay greatly increased wages for those he did get. It is undoubtedly true that the office of the Inspector of Factories is as much concerned with workpeople as with employers, and that a constant and steady pressure is required to bring both parties up to the level of practice which both admit to be desirable. One great use of these inquiries will be to demonstrate to the laborers that they must bear their part in the steps taken for the preservation of their health. — *Engineering.*



THE ARCHITECTURAL LEAGUE OF NEW YORK.

AT a meeting of the City-hall Committee of the Architectural League, held January 1, 1894, the following resolutions were unanimously adopted:

Whereas, The report of the Advisory Committee to the Board of Commission on a municipal building of the City of New York, has been handed in, and certain adverse criticism has appeared in the public press, and

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Whereas, Competition drawings can under no circumstances be more than elaborate sketches, the object of a competition is fully accomplished if a plan is selected which in its general features of design, both in ground plans and elevations, conforms with the instructions given, and offers a project which with careful study and without any radical departure from the original scheme of the design, may result in the construction of a thoroughly satisfactory building.

Resolved, That the undersigned Committee of the Architectural League of New York, after carefully reading the full report, believe it to be in accordance with the terms of the instructions, and hereby reaffirm their entire confidence in the judgment of the said Advisory Committee.

George B. Post, *Ex-Officio.*
Charles I. Berg.
John Du Fais.
G. L. Heins.
Bruce Price, *Chairman.*

SKETCH-CLUB OF NEW YORK.

The regular monthly meeting and dinner were held in the club-room on the evening of the 6th inst., about fifty members being present. The guests of the evening were Mr. James W. Taylor and Mr. W. W. Bosworth. The former gave an address on the subject of terra-cotta, referring to the use in antiquity during the seventeenth and eighteenth centuries; the history of its introduction into New York City, and the qualification and possibilities for its use in modern buildings. He also described its manufacture and gave valuable hints in regard to its construction. Several practical questions were asked by members and answered by Mr. Taylor.

Mr. S. F. Miller, a club-member, addressed the meeting briefly on the subject of steel beams, and gave each member a small hand-book relating to steel-beam construction.

It was announced that classes in architecture, water-color, and pen-and-ink, would commence during the following week. Through an offer made by Ernest Flagg, architect, arrangements have been made to open a studio of architecture in the club-room, which will be open at all times for the use of the members, and will be visited by Mr. Flagg each Tuesday and Friday. The work to be done will be largely upon the current problem of Columbia College, in accordance with privileges recently granted by it. A small charge will be made to cover current expenses and to start a fund for a library. The class in water-color will be conducted by Mr. John Galen Howard, and that in pen-and-ink by Mr. W. W. Bosworth. These classes are free to members. Four books were presented to the club at this meeting as a nucleus of a club-library.

Within the past month a contract has been signed with the publisher of the "Sketch Book" which is to be issued in a short time, and which will contain prints of competitive sketches, and other club-work, and the committee at this meeting called for drawings, and announced prizes in connection with the cover of the book and the advertising matter.

The December competition for a "Baronial Hall" was decided by ballot, Mr. Frederick A. Parkhurst receiving first mention. Seven drawings were handed in for the pulpit competition.

Edgar A. Josselyn, *Recording Secretary.*

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

THE GUNTON-TEMPLE MEMORIAL CHURCH, WASHINGTON, D. C. MESSRS. HORNBLOWER & MARSHALL, ARCHITECTS, WASHINGTON, D. C.

[Gelatine Print, issued with the International and Imperial Editions only.]

MAIN PORCH OF THE GUNTON TEMPLE MEMORIAL CHURCH, WASHINGTON, D. C. MESSRS. HORNBLOWER & MARSHALL, ARCHITECTS, WASHINGTON, D. C.

THE point of interest is the incorporation of the Memorial inscription into the ornamentation in such fashion that it is a part of the decoration and not tacked on as a sign as is too frequently the case. The exterior of the building is of green serpentine stone from Chester County, Pa., and the trimmings of Indiana limestone. The color mass effect is good and not spotty as is frequently the case. The carving was done by Mr. James F. Earley.

THE PROPOSED INN AT NAYATT, R. I. MESSRS. CLARKE & SPAULDING, ARCHITECTS, PROVIDENCE, R. I.

The scheme for the proposed Nayatt Inn secures the advantages of separated cottages without losing the convenience of a hotel. The different buildings being connected by covered piazzas or enclosed corridors, the guests may pass between their private apartments and the various parlors, public rooms and dining-halls without exposure to the weather and yet enjoy a degree of quiet and an amount of fresh air and sunlight impossible when all the departments are under a single roof. The service court and the servants' quarters are entirely secluded and the guests' apartments command an unobstructed view of the water and surrounding country. The first story will be of brick and the remainder of half-timber work.

INTERIOR OF THE CHAPEL OF THE CONVENT OF LA RABIDA, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL.

[Additional Illustrations in the International Edition.]

DETAIL OF THE CENTRAL PAVILION OF AGRICULTURE BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

CHIMNEYPIECE FROM THE CHÂTEAU D'ECOUEN.

[Copper-plate Photogravure.]

DETAIL OF THE SAME.

[Copper-plate Photogravure.]

HALTON, ENG.: THE WINTER GARDEN.

ROYSTON PARK ESTATE, PINNER, ENG. MR. J. NIXON HORSFIELD, KINGSTON-ON-THAMES, ENG., ARCHITECT.

This illustration represents detached residences erected on the Royston Park Estate, which adjoins Pinner Station on the London and Northwestern main line. This undulating and finely-timbered property is being developed under most favorable auspices. It has been judiciously laid out exclusively for detached houses with large gardens.

COMMUNICATIONS

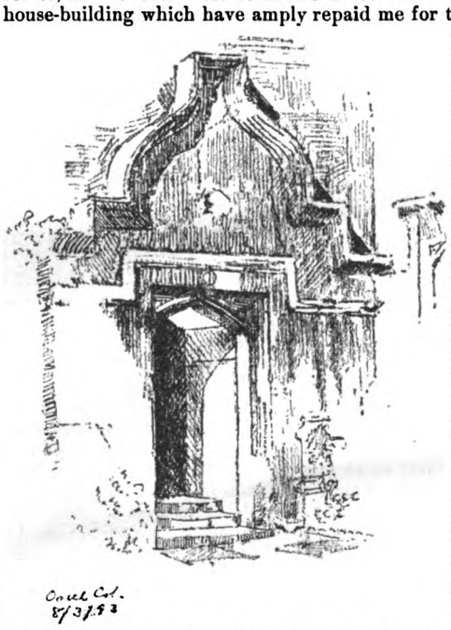
[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

MODERN ENGLISH WORK.

Philadelphia, Pa., December 14, 1893.

To the Editors of the American Architect:—

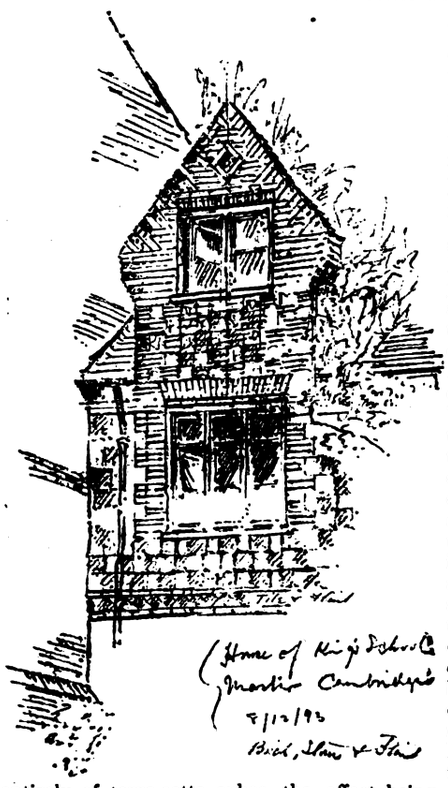
Dear Sirs, — I forward by post some sketches made in England during a short visit this summer. If you find it worth your while I wish that you would select a few for publication. I made the trip for the purpose of studying the character of English domestic work, and feel that, though my sketches may not be of much value in themselves, I have been able to arrive at certain conclusions regarding house-building which have amply repaid me for the time and trouble spent. It will hardly be seriously disputed, I think, that our architects have not yet succeeded in adopting any fixed standard which a minority even of the serious-minded members of the profession are willing to accept. It is not a question of ability and talent, of course, but one of direction and impulse — or of selection and adaptation — and a study of the sort of life which we wish to image and, in a certain way, dramatize. It is probably fair to say that the only houses so far built in America which have taken a common character and deserve any credit from an æsthetic point of view, and from a point of view of suitability, are of the class such as are found at the sea-coast — unconventional and suited to their surroundings and the



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life which is led in them; but a life which is only a reaction from our real life, and must be looked upon as a side issue.

I hardly think that any sort of a stand can be made for the Colonial style — so-called — which seems to me to be only an incomplete study of architecture, and is too much confined to the consideration of details. Its strong hold upon the public seems to be largely due to sentiment, but I think that if our clients had a more intimate knowledge of English history and social life, before and since the date of its adoption — if they knew what it had grown out of, and what has followed down collaterally in the progress of English Renaissance — how consistent in their better work the English have been, and how the houses of the present only differ from those of the past in the materials used and in requirements, they would see what folly it is for us to talk of more than a limited difference between our work and that of England. During the past few years there has been an enormous quantity of very meretricious work done in England, and especially in London. This is probably attributable to the fact that the architects of the present generation are not so serious-minded as those who are nearing the end of their active business-lives; also a partial reaction has set in, and cheap terra-cotta has done much mischief both in town and country. There are new buildings in London which seem to be constructed entirely of terra-cotta cubes, the effect being unsubstantial to the last degree, and uninteresting, since terra-cotta has no virtue when it is not decorated or used for decorative purposes. For purity of taste and dignity, as well as a good constructive feeling, we must, I think, go back about fifteen years, or at any rate to the work of men who have not been influenced by this later feeling.



Perhaps some of it might be accused of a sort of barrenness if it were not clearly understood what kind of life these houses represent. We have no such problem, for example, as the satisfying of the needs of a retired Viceroy of India, to whom greatness is accorded by common consent, and who should build his house in keeping with his station. I do not say that there are not men in America who might build these houses, but that such houses are not in accordance with the temper of their minds, and that they would not be satisfied. I should unhesitatingly put two architects as easily the first men of the last half of this century. They are Mr. Philip Webb and Mr. R. Norman Shaw. Mr. Shaw's work perhaps does not show the same personality as Mr. Webb's. He has a group of houses on the Chelsea Embankment which I think express the best sort of town life in the most noble manner — I speak only from the point-of-view of feeling. I cannot think of anything which can compare with them in their way. It is true that their situation is particularly happy, but he has certainly turned it to the best advantage. Mr. Webb has one house in Surrey and another near Salisbury which I would place far above any modern country work I have ever seen. The one in Surrey is a large, comfortable manor-house, while the one near Salisbury has about forty bedrooms alone. In the last-named house Mr. Webb has used absolutely no architectural details from the common stock, everything is his own and everything is wholesome and good. The house is distinctly of the Renaissance and yet it would certainly not have been what it is if the traditional experience in Gothic work were eliminated.

Before I finish I should like to say a few words about what seemed to me to be just as perfect in its way as the houses above mentioned, though of an entirely different kind. This is the interior of Daly's Theatre (London), just opened. It has the effect of having been entirely modelled by a sculptor, and one, too, who knew so much about architecture that he could afford to use it very sparingly. There is not a capital or a console in it and no striving after constructional effects, which seem to me to be the curse of such work in America.

Since the theatrical and literary world, in London are making such strides, it is not strange that the man has been found who can design a fitting place for representation, and it is to be hoped now that our education is taking such subtile and complex form, that architecture will become a thing better understood and more in tone with the beings for whose satisfaction and improvement it should exist.

Yours faithfully, WM. M. ELLICOTT.

THE VENTILATING OF OFFICES.

NEW YORK, N. Y., January 3, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Dr. F. A. Adams, in the Philadelphia *Record*, speaking of the evils arising from the intense heat in the average office, suggests that the prevalence of pneumonia among clerks and business-men may be due to this entirely. The careful work of the mason and woodworker prevents all chance of cold air entering, and with steam turned on, they spend the day in a tropic air; at night, going to their homes, they pass a considerable time in the cold air of the street or car, and the lungs being unfitted for the change, are seriously affected.

While the change of temperature has some effect, not enough importance is placed upon the fact that the majority of offices are not only very warm, but they have practically no ventilation. It is not a serious matter to have *cold* air deterred from entering a room, but it *is* necessary for good health, that some pure air should enter regularly. Hospitals, court-houses, and most good residences and public buildings have a system, more or less effective, for ventilation. This is often thought of, only as heating, as a hot-air system necessarily ventilates as well as heats.

In an office-building, however, ventilation is considered only in the halls and larger rooms, and the offices that each day hold a small army, are so tightly made that water would hardly leak out, were the room filled with this liquid. It is well-known that clear thinking depends upon the condition of the body. Is it reasonable to suppose that the brain can act to best advantage, when the close atmosphere causes indigestion and headaches? Is it a wonder that bromides are taken as regular medicine by so many business men?

Surely, the architect can impress upon the owner that the increase in cost in building flues, introducing some system of air-heating and air-circulation will be well repaid by the increase in rent.

People are wild on steam and hot-water heating, and forget that with the furnace heat their homes and offices were always filled with pure air, while with the clean and easily regulated heat from the radiator, they live in an atmosphere that will undermine the strongest constitution.

We are very truly yours, EDWIN A. JACKSON & BRO.

NOTES AND CLIPPINGS

THE PIPEAGE OF PETROLEUM. — One of the earliest problems in the commercial distribution of petroleum was that of transportation. The market for the crude product was the refineries, mostly located in large cities, especially those on the seaboard. The crude oil was put in barrels and loaded on trucks and transferred to a central point, the damage to barrels and the leakage of oil being considerable. Where water-courses were available, the barge became a popular method of transport The tank-car on the railroad followed, and, in keeping with supply and demand, has improved in plan of construction and gallon capacity. As the petroleum industry developed in magnitude and the economics of transportation became an important commercial question, the pipe-line came in logical sequence to the railway-car and the barge. This meant a considerable reduction in cost of transit, and, as a commercial consequence, the locating of immense refineries in the most available centres for distribution and a revolution in methods of manufacture as in cost. The introduction of the pipeage system met with the usual experience of all such innovations, the owners and drivers of oil-wagons, anticipating a loss of occupation, resorting to violent methods of prevention. Pipe-lines were cut, tanks set on fire, and armed patrols became necessary to furnish security to life and property. As usual, obstruction of this kind was forced to the wall, the new method gradually extending till the oil regions became a net-work of pipes, and trunk-lines conveying oil found their way as channels of supply to central points in New York, Philadelphia, Baltimore, Cleveland, Buffalo, Pittsburgh, Chicago and elsewhere. As an instance of this development, the trunk lines carrying Pennsylvania crude-oil, not including local net-works of the two-inch pipe, are placed at near 3,000 miles in length. The total pipe, according to evidence given before the State Legislature in 1891, was said to cover a line length of 25,000 miles, carrying the Pennsylvania products from local to terminal points. The amount of pipe and material used in this method was simply prodigious, and representing an equally broad employment of industries concerned in manufacture and construction. Some of these tanks have a storage-capacity of from 30,000 to 35,000 barrels, and the pumps employed in certain forms of severe service are magnificent machines. The pipes used in the trunk-lines are made of wrought-iron and are tested to stand a pressure of 2,000 pounds to the square-inch. The loading of cars by movable pipes is in line with the simplicity and efficiency of the transportation apparatus. By this method a number of cars are loaded at the same time, the economics in labor and time being carefully studied and applied. It is to such factors as these that the commercial importance of the American petroleum industry is largely due. — *The Age of Steel.*

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Henry Vizitelly. — If we admit the facts are as the New York *Times* state them below, a most conscientious worker in the field of art and literature was most shabbily treated.

"Henry Vizitelly, whose death at Farnham, England, was announced in these columns recently, was, in the regard of many young English artists, a martyr; of many others, a great culprit; of the greater number of conservative persons, a good man who had committed a grave error, but had deserved indulgence. He was seventy-three years of age. He was imprisoned at seventy in Hollywood Jail for having translated '*L'Assommoir*,' '*Nana*,' '*Pot-Bouille*,'' and other works of Zola. The cable-telegraph takes pains to say that he had been in feeble health since his imprisonment. He was born in London. His father was a printer of books, and caused him to be instructed in the art of wood-engraving. These were days of enthusiasm for republicanism in England. The young man was studious, but with a restive anxiety to express startling opinions. He was one of the first artists of the *Illustrated London News*. He attained great distinction by his work for this paper for several years, but his thoughts were constantly turned to projects of nationalizing ideas which were not essentially English. He went into the business of publishing books on his own account in order that Harriet Beecher Stowe and Poe might become known in London. This, at least, is the contention of his admirers; of course he had enemies, who ever questioned his disinterestedness. At all events, he introduced the works of Poe and '*Uncle Tom's Cabin*' to the English. He published '*Evangeline*' and '*Hyperion*' with illustrations by Sir John Gilbert and Birket Foster, which have retained their charms and their artistic value. He decided that the newspaper-stamp impost was unjustifiable, and he founded a weekly newspaper for the special purpose of combating it. He bore alone the brunt of the fight, succeeded in causing the abolition of the tax, and then ceased the publication of his journal, with the remark that its mission had been accomplished. He was correspondent of the *Illustrated London News* during the Franco-Prussian war, a daring, careful, brilliantly-descriptive war-correspondent, writing from personal observation, and not, as some of his colleagues, from reminiscences of the Illiad. He was in Paris during the siege and the commune, and his letters were everywhere admired. He remained in Paris for some time after the war, becoming intimately acquainted with the literature of France, and in 1880 decided to publish it in England. Then came a series of books which were a revelation of the delicate art of the French vignettists of the eighteenth century in such works as Dorat's '*Les Baisers*,' Montesquieu's '*Temple de Guide*;' of the luxuriant art of the romanticists, in such works as Theophile Gautier's '*Mademoiselle de Maupin*'; of the admirably objective art of the realists, in such works as Gustave Flaubert's '*Salammbo*.' His translations were almost perfect. There had never been as faithful transcriptions of stories from one language into another; there had never been as truly artistic renderings of French art into English literary form, and Vizitelly was encouraged by the praise which his works commanded for its technical skill to attempt to anglicize Zola's '*Rougon Macquart*.' After the publication of '*L'Assommoir*' he was warned that he would be prosecuted if he continued, but he continued, and in July, 1889, despite the protest of influential people, was condemned, at the instigation of a society for the suppression of obscene literature, to imprisonment for three months. Pinero, Walter Besant, Lynn Lynton, Henry Irving, Edmund Yates, Archibald Forbes, and George Augustus Sala signed, in vain, a monster petition for Vizitelly's pardon. His books were confiscated, his business was ruined, and the indiscreet activity of his friends, more perilous than the attacks of his enemies, resulted in a deluge of pamphlets as detrimental to his interest as the one in which Robert Buchanan appealed to Henry Matthews, then the Tory Home Secretary, as a Roman Catholic, in the name of Roman Catholic indulgence for Lucretius, Juvenal, Catullus, and Aristophanes. Last year, while Vizitelly suffered for having translated the works of Zola, Zola himself was lionized in London, and those who deemed it necessary to explain this inconsistency to naive minds explained that Zola had a moral aim and Vizitelly no other aim than to make money. But those who appreciated Vizitelly's conscientiousness as a man of letters and an artist may not be easily persuaded that the translator of Zola's works was less deserving than their author of respectful consideration for the motive that actuated him.

The Water required for Flushing Closets and Drains. — A special committee of the Sanitary Institution have just issued a report on the quantity of water required for flushing water-closets, in which a very substantial increase in the amount now commonly used is recommended. In the course of their work the committee have carried out a series of over 800 experiments, and their recommendations are, therefore, of great weight. A number of drains were laid, consisting partly of pipes and partly of half-pipes and open channels. The gradients adopted for the four-inch drains, 50 feet long, were 1 in 30, 1 in 40, and 1 in 76, and for the 4-inch pipes, 26 feet long, 1 in 40. The 6-inch drains 50 feet long were laid at 1 in 30 and 1 in 40, and those 26 feet long at 1 in 40. At the head of each drain a simple short-hopper basin of good type was fitted, having an S-trap with a 2-inch seal leading with a bend into the drain, the top of the closet basin being 2 feet 3 inches above the drain. A good siphon waste-preventer, discharging 2 gallons in five seconds and 3 gallons in ten seconds, was placed 4 feet 3 inches above the basin with which it communicated with a 1 1-4-inch pipe. Artificial excreta, made out of soft soap, cocoa fibre, and clay, together with five pieces of newspaper, were placed in the basin and the flushing-cistern discharged, noting in each case how much material was left in the closet-traps, in the drains, and in the disconnecting traps placed at the lower end of the drains. The amount that passed through was also noted. As regards the closet-trap, it was found that a 2-gallon flush left, on the average, 5 per cent of the material in the trap, whilst a 3-gallon flush practically cleared, the retention being 1 per cent only. In the drains little difference was found between the 4-inch and the 6-inch. When fifty feet long and laid at 1 in 40, with a 2-gallon flush, 21 per cent of the material was retained, and with a 3-gallon flush 3 per cent. In disconnecting traps, 30 per cent was retained with a 2-gallon flush, and 26 per cent with a 3-gallon flush. In the case of the 26-feet drains, 3 per cent was retained in the drains, and 26 per cent in the disconnecting trap, with a 2-gallon flush, whilst with a 3-gallon flush these figures were reduced to 1 per cent and 19 per cent respectively. Taking a general view of their experiments, the committee consider that the minimum flush should be fixed at 3 gallons, and the maximum at not less than 3½ gallons. — *Engineering.*

Accidents from Thawing Dynamite. — The most fruitful source of accidents with dynamite is the thawing of the cartridges, which solidify and become inert at a comparatively high temperature, namely, about 40° F. To thaw the cartridges, tin warming-pans are, or should be, provided, and if used with ordinary care they form a safe and efficient means of carrying out this operation. They are constructed on the principle of the glue-pot, the cartridges being placed in the removable portion and covered up, the bottom part being filled with warm water. So reasonably safe is the use of this contrivance, that the author can only recall one instance of an accident occurring in its use. On the other hand, a very large number of persons have been killed, and a still larger number seriously injured, and much property destroyed, through the improper thawing of dynamite. A great deal of misapprehension and misplaced confidence has been caused by the fact that small quantities of unconfined nitro-glycerine, and explosives containing it as their chief constituent, will sometimes burn quietly away when ignited by direct contact with a flame. It has, therefore, been thought that if this was the case, no ill effects could arise from simply heating it. This idea, as the author has already observed, is a terribly mistaken one. If a cartridge of dynamite or its congeners is lighted or placed in a fire, it may burn harmlessly away. But if a similar cartridge is placed on the hob of a stove or an oven, and gradually heated up to its exploding point, which is from 350° to 400° F., a violent explosion will almost inevitably result, and before that point is reached the explosive will become extremely sensitive to the slightest shock. Nobel states that when dynamite is heated to 440° F., it is liable to explode. But Nobel is the apostle of dynamite, and is liable to look a little too favorably upon its faults. Colonel Cundill, one of Her Majesty's Inspectors of Explosives, gives 360° F., as its exploding point, and Eissler, in his work on explosives, states that when dynamite is heated to 350° F., a dime falling upon it will explode it. — *B. F. Nursey before the Society of Engineers.*

Slow Poisoning by a Patent Stove. — A most wholesome judgment, our Paris correspondent says, has been given by the Second Chamber of the Civil Tribunal there in a case brought for damages by a seamstress against a fellow-tenant. The latter bought a slow-combustion stove and set it up in a room contiguous to the one the seamstress occupied. The chimneys of both rooms opened into a common flue. When there was a return smoke, the poisonous fumes of the stove were brought into the seamstress's abode. Poisonous fumes also made their way through chinks in the partition-wall, and the result was that the poor woman lost her health and had to go to the hospital where she was kept six weeks. When she returned home the headache, drowsiness and comatose fits returned, and she lost the use of her limbs. Her doctor then thought of asking whether there was a slow-combustion stove connected with the chimney-flue, and discovered the cause of his patient's ruined health. He advised her to bring an action against the landlord, but he pleaded that it was not he who set up the stove. The tenant who did was next sued, and the Tribunal has decided that he was responsible inasmuch as he did not first ask the landlord's leave. The latter is exonerated by the silence of the tenant, who cannot plead in his defence the article of the Code which obliges landlords to keep their chimneys in repair. When that article was framed, no means of heating other than the open fireplace with quick-combustion fires was contemplated. Damages were assessed at £250. —*London Daily News.*

Marseilles Cathedral. — France is continually offering surprises to observers, and it is not one of the least to learn that a new cathedral has been opened for service in Marseilles. It is, however, far from completion, although about fourteen millions of francs have been expended. The foundation-stone of the building was laid on September 26, 1852, in the presence of Louis Napoleon, who was at the time President of the Republic. The English contemporary journals record how "the Prince has given orders for the Cathedral of Marseilles to be rebuilt on its present site. The Minister of Public Worship has obtained a credit of 2,500,000 francs to meet the expenses, which sum is to be paid off in ten years." Ten times the amount then estimated will be required before the building is finished. The ceremony of 1852 was only a prearranged incident in the Presidential Campaign, for the works were not commenced for two years. The new cathedral has had no less than four architects, viz, MM. Vaudoyer, Esperandieu, Révoil and Erard. — *The Architect.*

Shore Property for Government Use. — A case has been on trial in the United States Court at Portland, Me., for the past week, the verdict in which, rendered last night, will have an important bearing on the shore property wanted for government uses. The Government wanted thirty acres of land on Cushing's island, south of the Ottawa House, for the purpose of erecting fortifications. Francis Cushing, the principal owner, claimed it to be worth $6,000 an acre. The Government refused to pay this price and the case was tried before a jury for the purpose of fixing the value. The jury gives to Francis Cushing $84,240 for thirty acres of land, on condition that he first extinguish all mortgages on it, so that he can convey a clear title. To John K. Robinson, of Chicago, another owner, the jury gives $19,000. The Ottawa Hotel Company is given $9,000 for damages to hotel. — *Springfield Republican.*

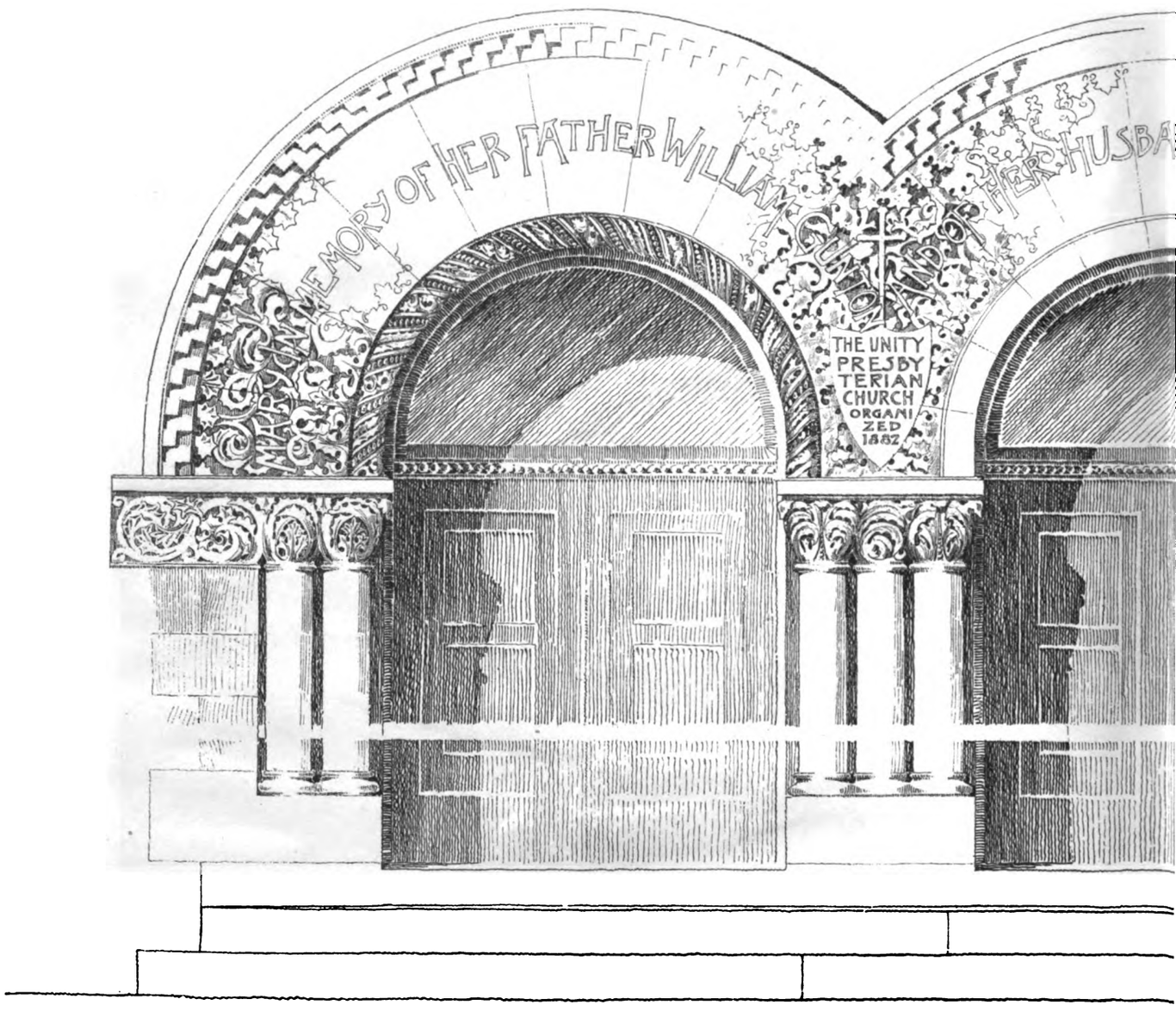
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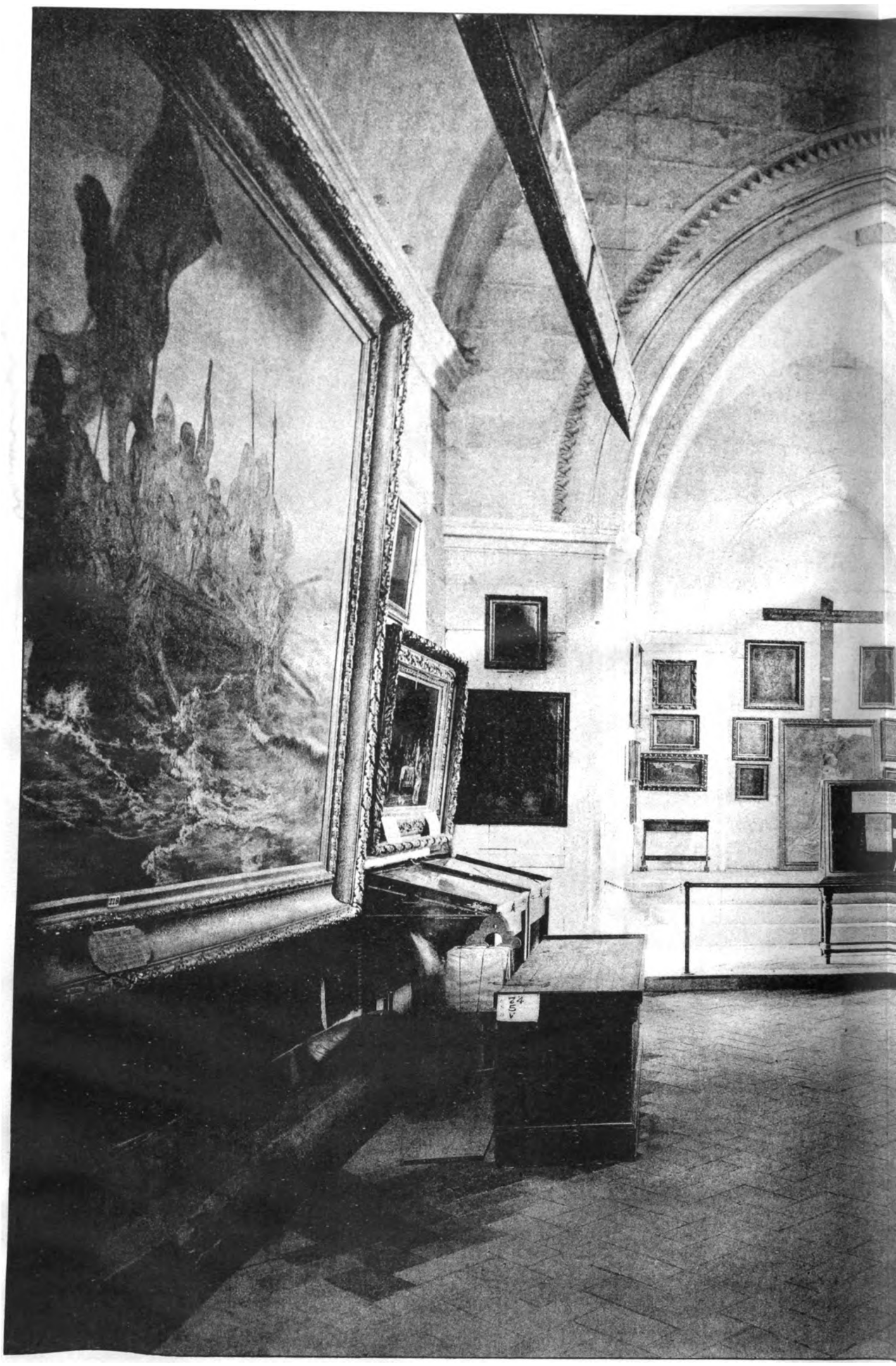
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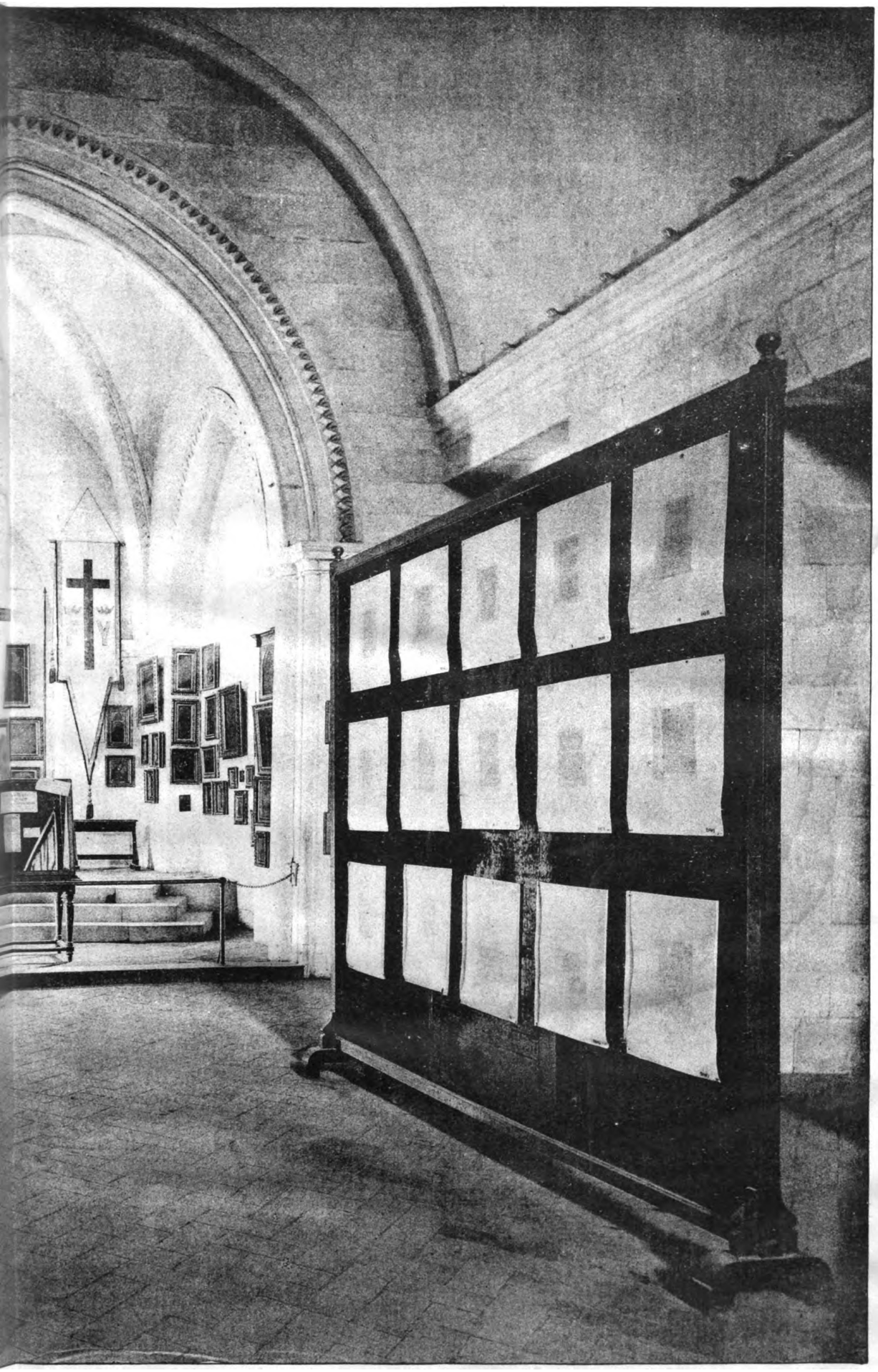
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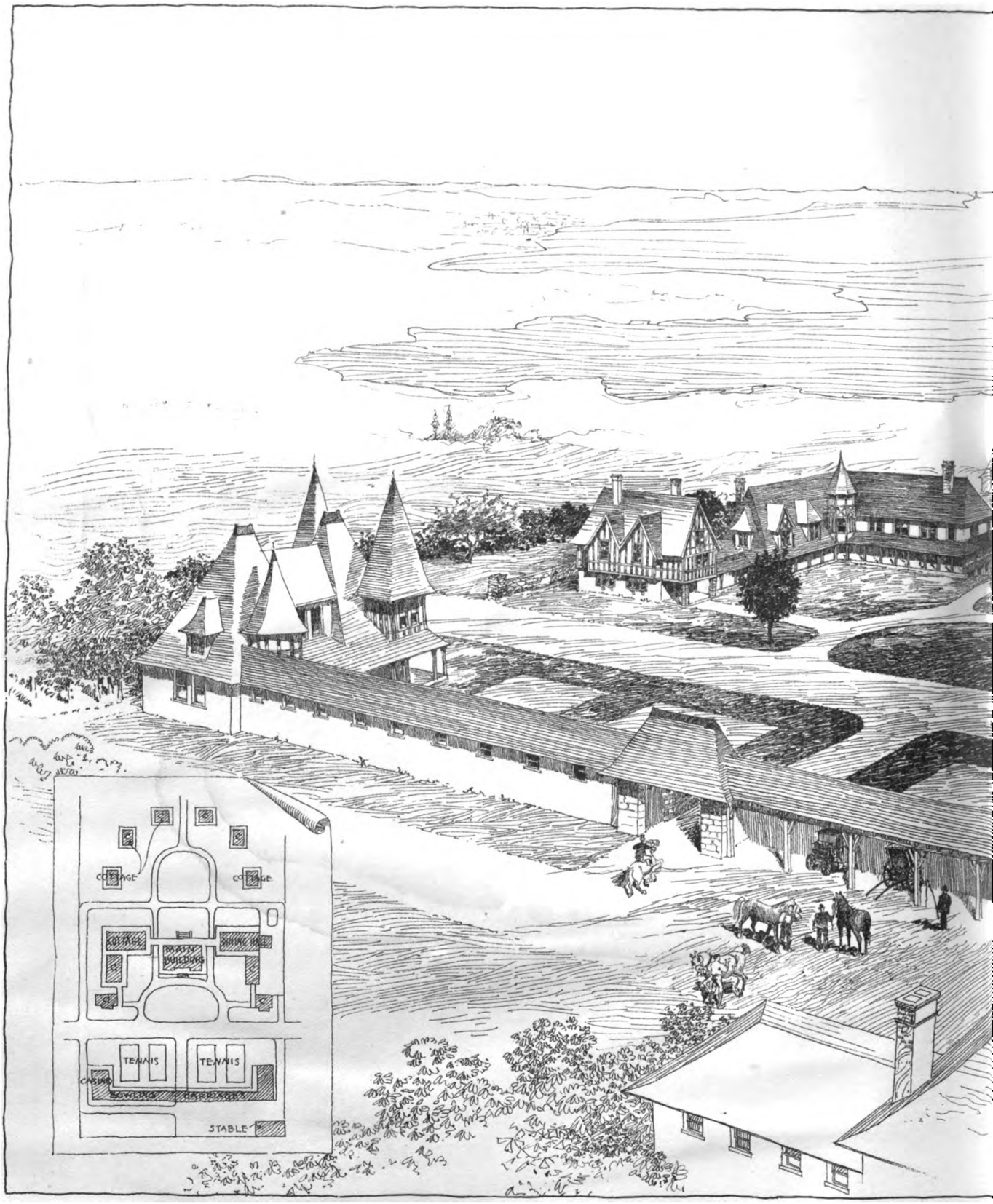
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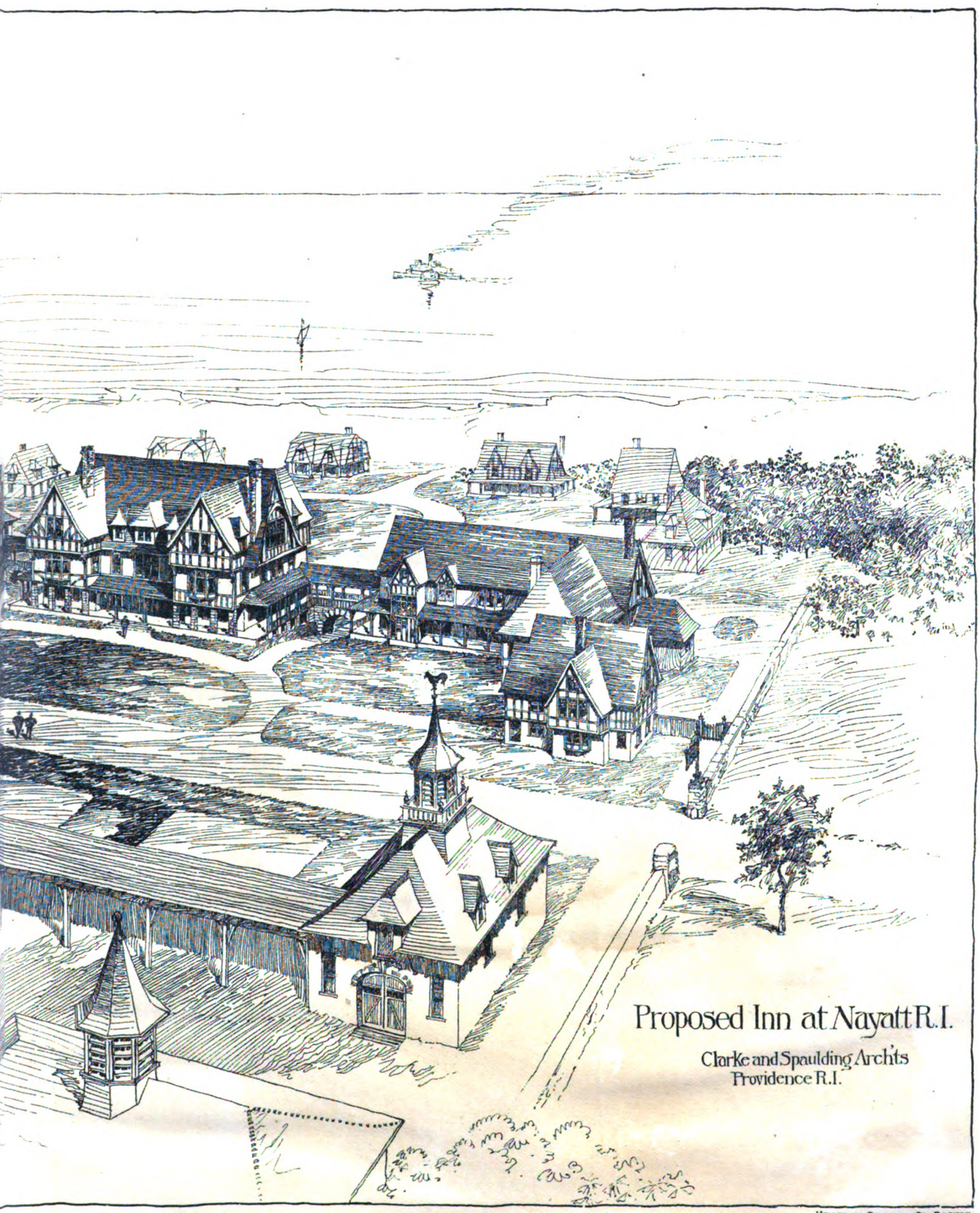
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JANUARY 20, 1894.

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A PECULIAR case, in which the architect of an important building is a party, is on the calendar of the Massachusetts Supreme Court. Most architects know something of the new Boston Court-house, which has been building for the last seven years; and the Boston architects, at least, know something of the unamiable relations which have existed for a part of that time between the architect, Mr. Clough, and the Commissioners who have had charge of the matter as representatives of the State and city. The building is now nearly finished, and Mr. Clough, whose work is practically over, has brought suit for fifty thousand dollars for compensation for extra plans, made by him, but not used, including the costs and expenses of the collection. It is understood that the actual bill for the work done was between twenty and twenty-five thousand dollars, but compound interest at six per cent would be added to the claim, and an allowance is usually made by the courts to a successful claimant, as compensation for the expense of collection, to which he has been unfairly put.

AS to the merits of the case, we know nothing, except what can be gathered from the Boston papers. A reporter for one of these lately talked with some of the Commissioners, one of whom very frankly explained that the extra drawings for which compensation was claimed were made in connection with a dome, or tower. The original design, which was submitted in competition, showed the building surmounted by a dome. When the matter had so far advanced that public attention was called to the intended appearance of the new building, a discussion arose, particularly among lawyers, as to whether the building should have a dome at all. According to our own recollection, the dome controversy raged for a long time, and at least one outside architect of eminence was called in to offer suggestions. Finally, the Commissioners called a meeting of the Suffolk Bar, which voted that it would be better not to have a dome. The dome was, accordingly, left out of the elevations and sections, but the plans were drawn in such a way as to furnish foundations for a dome, if it should subsequently be decided to put one on; and it appears that the architect drew designs for one or two modified domes, of less importance, and smaller expense. In the end, however, the Commissioners ruled out domes of any kind, and the plans were changed again, so as to provide no foundations for such a feature. It is for making and changing these plans and other drawings that the larger part of Mr. Clough's claim is made. According to the Boston *Daily Advertiser*, one of the Commissioners acknowledges that the original dome was shown in the competitive design accepted by the Commission, and that the plans for it were made by the architect before it was decided to leave it out, and thinks that "of course, he should get something, but not twenty thousand dollars"; but claims that the designs for a modified dome were made without the authority of the Commissioners. Rather unfortunately for this claim, another Commissioner, according to the *Advertiser*, says that "Clough . . . brought in a tower that would cost sixty thousand dollars, after two others had been rejected." "I told him," this Commissioner goes on, "we didn't want any cupola; if we had anything in that line, it should be a large flat dome." A more satisfactory admission that Mr. Clough made these drawings for the benefit of the Commissioners, who, after the abandonment of the original dome, did not themselves know what they wanted, and looked to him to devise something that they would like, it would be hard to imagine; and the picture of the relations between Mr. Clough and the Commission disclosed by the same speaker, who says that he "began resigning four years ago" because he was "tired of fighting that architect," does not indicate that a disposition to do him perfect justice has prevailed in their deliberations.

WE remember well the feeling of gentle satisfaction with which we welcomed perhaps a dozen years ago the first of the contributions of Mr. W. Watkiss Lloyd to this journal, for it seemed to be proof that the *American Architect* had at length achieved a respectable rank amongst journals dealing with art and architecture. Our knowledge of Mr. Lloyd was at that time limited to the fact that he was one of the most learned of English writers on architectural archæology and we have had to await the day of his death, which took place December 22, to learn that he was born at Newcastle eighty years ago and that he first made his reputation as an able critic by publishing in 1845 an essay on the "*Xanthian Marbles*." Since that time his pen was rarely idle, and he has produced a vast number of notable essays, papers and discussions and not a few books, some published, some remaining still in manuscript. His best known book is the "*Age of Pericles*," published in 1875. Amongst his unpublished works are translations of the "*Iliad*" and the "*Odyssey*," a "*History of Greece*," "*Michael Angelo and his Century*," etc. Personally he was a modest and amiable gentleman, a ripe scholar in spite of not being a "university man." The *Architect*, whose connection with Mr. Lloyd was much closer than ours, speaks of him as "a sixteenth-century scholar who was born out of date," a man of "immense erudition," "a living concordance to classic literature."

RAPID-TRANSIT in Boston has advanced a stage, by the decision of the City Government to build a subway, about a mile in length, under Tremont Street extending from Warrenton Street, at the junction of Tremont Street and Shawmut Avenue, to Scollay Square, or perhaps as far as Haymarket Square. Whether the subway shall be built in the form of a tunnel, or as an open cut, and subsequently roofed over, is undecided as yet, and the exact route is not entirely settled. There is much reason for thinking that the construction either of a tunnel, or a deep, open cut of the width intended, through the narrow part of Tremont Street, would either undermine dangerously the high buildings, or would necessitate very costly underpinning or sheet-piling; and the people interested in that large portion of the city which lies to the northwest of Tremont Street would like to see a branch of the subway extended to Park Square, for their benefit. The intention is to lay four tracks in the subway, and run the street cars through it, instead of on the surface of Tremont Street, which is now, in that part, very crowded. With four tracks, it ought to be possible to run express cars from Haymarket Square, where they would be within easy reach of the northern railway stations, to Warrenton Street, or Park Square, in five minutes, thus saving an immense amount of time, as the same trip, in the surface cars, takes now about half an hour, and, in the busy hours of the day, often much more.

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WE have an idea that if the Boston people should really get a taste of rapid-transit, they would soon want a great deal more than a tunnel under Tremont Street can provide. For example, volunteered plans are already drawn, and the land purchased, for a new Music Hall, at the corner of Huntington Avenue and West Chester Park. In this hall will be given the Symphony concerts, as well as, probably, all of the best musical entertainments, public balls, fairs and so on; yet the region in which it is situated, though densely populated and fashionable, is one of the most inaccessible in the city for any except those who live in it. Even after the completion of the rapid-transit tunnels, the people from the northern suburbs, who form a large part of the public from which concerts in Boston draw their support, will be left nearly two miles from the hall, and will have to finish their journey to it either on foot, or by the slow and crowded surface cars. In either way, the time from the southern end of the tunnel, which must also be the terminus for all express trains, to the hall would be little less than an hour, and the suburban lovers of music will have to go without their dinners if they expect to hear the first chords of the Symphony concerts in the new hall. The contingent from the southern suburbs, which is at least equally mportant, will be little better off. The Boston and Albany railroad has, indeed, at present, a place within a little less than a mile of the hall, where incoming trains stop before crossing the tracks of the Providence railroad, and where a flight of steps is provided, by which passengers who have business in the neighborhood can climb up to the street; but the outward trains stop at a different place, about half a mile farther off, and it is reported that, by a system of interlocking switches, the necessity for both these stopping-places will be done away with, and passengers by the Boston and Albany road, as well as by the Old Colony, will have to go to the main station, and find their way thence, by surface cars, about two miles to the hall. The Providence road, alone, has made preparations for building a station about fifty rods from the hall, at the intersection of the Brookline, Cambridge and Dorchester surface lines, where an important business centre is likely to be developed. As, by means of this station, it would be perfectly easy for a hand-car to run there in a few minutes from either the Albany or Old Colony stations, or from South Boston, over a system of tracks already laid and connected, and as these tracks approach within a few rods of the main subway, at the Tremont-Street crossing, and of the proposed branch at Park Square, and are laid at a level which would permit of ready connection with the subway tracks, it hardly seems possible that these few rods will not, sooner or later, be broken through, and the three or four miles of subway already existing in the heart of the city be added to the system which the city is about to construct at so enormous an expense.

THE Metropolitan Traction Company, of New York, has written to the State Railroad Commissioners, offering a prize of fifty thousand dollars for the invention of a system of street-car propulsion, superior to the cable and the trolley. The Company says, in its letter to the Commissioners, that the cable-system is the most economical yet invented for streets where the lines are straight, and the business heavy, but is not available for crooked streets, or for general use in cities; while the trolley-system, which can be used for crooked routes, it thinks would not be acceptable to the public in New York. In this dilemma, it appeals to the inventors of the country for help, and promises fifty thousand dollars in cash, as a prize to any person who shall, before March 1 next, submit to the Commissioners an actual working-system of the sort required. The Company exacts no rights in the invention, in return for its prize, nor will it interfere with the award that the Comissioners may make, its object being simply to develop the science of street-car propulsion, primarily for the benefit of the public, and, later, for its own benefit, if a system should be brought out by this means which it could successfully adopt.

ONE of those extraordinary instances of carelessness which occur from time to time in New York, in relation to building-operations, forms the theme of various articles in the daily papers. It seems that a certain Mrs. Shanks undertook to build a house, on land belonging to her in Harlem. The house was built, but, after it was all done, it turned out to have been built, not on Mrs. Shanks's lot, but on the adjoining one, which belonged to a Mrs. Williams. Mrs. Williams's astonishment at finding that her land had been enriched, at some one else's expense, with a four-story house, was hardly less than that of Mrs. Shanks, at finding that she had bestowed her money on her neighbor; while three lawyers, who held as many mortgages, for money advanced to build the house, were by no means agreeably surprised to find that they had advanced ninety-five hundred dollars on a piece of real-estate which still remained vacant, and which would not sell for more than four thousand dollars. However, troubles of that kind are soon righted among honest people. Mrs. Williams told Mrs. Shanks that she would take no advantage of the mistake, but would sell her the lot on which the house stood at its value as vacant land; and in her turn, Mrs. Shanks informed her mortgagees that when the lot was transferred to her, she would transfer the mortgages from the unimproved to the improved property. This programme was carried out, and all parties are now, we hope, enjoying the contentment which only a clear conscience can give. It is singular that mistakes of this kind should be so common in New York, where the rectangular and uniform disposition of the streets makes it particularly easy to stake out lots correctly, but this is the third or fourth instance within a few years of a house having been built entirely on the wrong lot of land. So far as we know, a friendly and honorable arrangement has been made in each case; but, if some avaricious owner should try to retain the property thus wrongly bestowed upon him, it might turn out that the responsibility of the surveyor who staked out the lot would be unpleasantly called in question.

A FEW months ago, a workman in the cut-glass factory of Oullins, near Lyons, became obnoxious to the local glass-cutters' Union, and a strike was ordered, to continue until the man should be discharged. The manager of the factory held out for a time, but finally sent the man away, rather than have his business stopped. The discharged workman applied to the proper court, in this case the Civil Tribunal of Lyons, claiming from the glass-cutters' Union damages for the conspiracy against him. The Tribunal refused to entertain the action, on the ground that "The pressure exercised by workmen on their employer, even in pursuance of a concerted plan, to secure the discharge of one of their comrades, however regrettable it may be, does not constitute a misdemeanor." The Tribunal went on to say that "Strikes, and the incidents of strikes, cannot serve as the basis of an action for damages; a strike is a lawful means, employed by masters or workmen, to enforce upon each other their demands." Why it should be any less a misdemeanor for a gang of workmen to combine to deprive a comrade of his employment than to rob him of his money, the Lyons Tribunal does not explain; but the case gives a curious illustration of the extent to which trades-union tyranny has warped the minds of the community in the manufacturing parts of France. The reputable French newspapers comment severely on the decision, which would undoubtedly, on appeal, be reversed, the highest court in France having already unmistakably expressed itself on the subject. It is fortunate that in this country, where the Union tyrants are perhaps more reckless than elsewhere, the idea that any body of men, under any name whatever, can legally conspire to deprive another man of his living, has never found the smallest countenance in the courts; and, although the Unions constantly attempt such proceedings, the victims of them have rarely failed to find protection in the courts, where they have been appealed to.

THE regular annual competition for the American Prize in the Paris School of Fine-Arts was judged December 21, by a special Commission, whose President was M. Ginain. The subject assigned was "a Public Library, with Baths and Restaurant." Ten competitors entered, and the prize was awarded to M. Bigot, pupil of M. Laloux, with MM. Chifflot, Tronchet, Duquesne, Adone and Sirot as next in rank.

THE University of Illinois is to be enriched with a fine building for the engineering department, under the name of Engineering Hall, the corner-stone of which was laid a few weeks ago. The architect is Mr. George W. Bullard, a graduate of the University. It is a pleasure to think that the admirable work done by the Engineering and Architectural Departments of this University has received a recognition which will do so much toward facilitating and extending it.

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OFFICE-HELP FOR ARCHITECTS.[1]—XXIII.

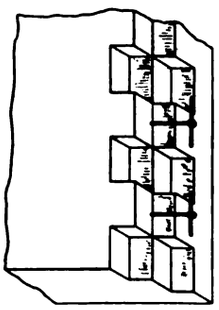


Fig. 111.

§ 306. Tying: — All masonry angles should be tied either by carrying the bond around the angles and consequently building the wall simultaneously, by building them with a tying slip-joint (Fig. 111), by metal anchors and block-toothing (Fig. 112), or by metal anchors and a slip-joint. Where the walls can be carried up simultaneously and are of the same height, it is best to carry the bond around continuously. Where the walls can be kept within one story of one another and are of the same height, the metal anchors and block-toothing are best. Where the walls are of stone, stone and brick, or contain large pieces of terra-cotta, a slip-joint should be used. In "skeleton construction," the section of the columns should be such that the filling-in will bond well around them; the wall of each story should be made entirely independent and be entirely carried by the framing; heavy brackets or corbels should be framed for; arches over openings should be self-supporting.

In Figure 113 is illustrated a typical section of a pier in skeleton construction with various ways of forming the column sections. If the building is relatively low, the ordinary Z-bar column carrying its supporting angle would be sufficient. The supporting angle would project at each end to within 4″ of the face of the wall, and at the side to within 2½″, and would carry a specially moulded brick or specially cut stone to make the joint. In high buildings where all of the wind-bracing that can be obtained is desirable, Z-bars may be spread as shown by the dotted lines with a heavy web-plate and stiffening angles put in, which converts it into a vertical girder, and adds very largely to the stiffness of the column, or a box-girder of two channels with plates on each side as shown on the alternative, may be used. For very tall buildings, one or the other of these should be used, and in addition to these the wind-bracing shown in § 249. For the lower members it is probable that the form made of channels will prove to be more economical. For upper section where they can be made smaller, the Z-bars would probably be the best. This general detail is not only good from a constructive point of view, but affords excellent facilities for putting in the heating and lighting lines of the building. Walls should always either carry themselves and the legitimate floor-load coming on them or else should be simply curtain-walls, carried by the framing and fire-proofing it.

§ 307. Frames: — In all good work in masonry, the door and window frames should not be built-in, but should have the recesses provided for them; after the wall is up, the frame should be set in place with the bed-mould removed. The exterior joint between the frame and the masonry should be caulked with oakum in the same way that a ship's seams are caulked. The joint on the back should be filled with Portland cement put in with a caulking-iron in manner similar to the tucking of a joint; then the bed-mould should be put on, and any openings between it and the masonry caulked with Portland cement.

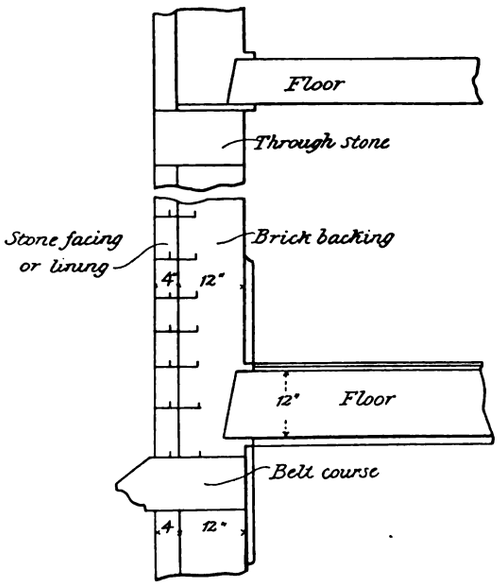


Fig. 112.

§ 308. Partitions: — Partitions may be made of a variety of materials, but should be made of porous terra-cotta or hollow fire-clay blocks 4″ thick. These partitions should never be loaded; when it is necessary to put a load on a partition, it should be made of common brick and proportioned as per § 302.

§ 309. Thin Partitions: — In office-buildings, and elsewhere where space is of great value, partitions 1¾″ thick can be made by spacing 1¼″ I-beams 2′ 0″ apart on centres and filling between them with hard plaster, using a scratch-coat mortar; then a brown coat is placed on over the whole in the usual manner, and finally finished off. The irons should be dropped into pockets made by boring 1¾″ holes through the upper and under flooring, down to the floor-arch and be held in position by means of two cast-iron wedges, wedging them fast at the top. They should be painted before being placed in position with the metal paint hereinafter noted, and then, when thoroughly dry, given a coat of strong alum-water so as to prevent staining through. The plaster-blocks are cast in moulds placed on each side of the small beams. The brown coat should be permitted to become thoroughly dry before the finishing coat is put on, as otherwise it will discolor the white plastering. A patent has been applied for on these partitions. Other thin partitions are made by using Cornell lath, Hayes

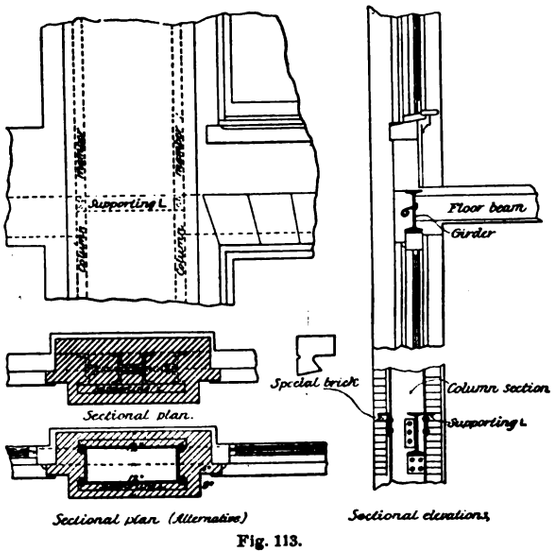


Fig. 113.

[1] By George Hill, Consulting Engineer. Continued from No. 941, page 6.

ABBREVIATIONS AND SYMBOLS.

= equal to.
|| parallel to.
÷ divided by.
× multiplied by.
+ added to.
a^2 a multiplied by itself.
$a > b$: — a greater than b.
$a < b$: — a less than b.
$\frac{a}{b}$: — a divided by b.
∴ therefore.
□′ square feet.
□″ square inches.
8# read 8 pounds per lineal foot.
[channel bar.
I I-beam.
T T-iron.
L angle iron.
deck beam.
● round section.

I ton = 2,000 pounds as this is the conventional ton, the legal ton is 2,240 pounds, but is rarely used.
l = the length between supports of any beam or girder or height of any column, always in feet.
b = breadth of any beam or girder, always in inches.
d = depth of any beam or girder, or the least transverse dimension of any column, always in inches.
L = total load uniformly distributed coming on any piece in pounds.
Lw = " " " " " per square foot in pounds.
W = concentrated load on any piece in pounds.
s = span of any arch or truss between centres of end pins in feet, or spread of footing courses.
A = area of any section in square inches.
M = maximum bending-moment in inch pounds.
n = distance of centre of gravity of section from either top or bottom edge in inches.
I = moment of inertia, neutral axis through centre of gravity.
R = moment of resistance of section.
r = radius of gyration, in inches.
Sc = safe compressive strain in pounds per square inch.
St = " tensile " " " " " "
Ss = " shearing " " " " " "
S = strain per square inch in extreme fibre.
P_e = upward reaction of support at left-hand end of beam.
P_f = " " " " " right " " " " "
e = distance of centre of gravity of load from left hand of beam.
f = " " " " " " " " " right " " "

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lath, Expanded-metal lath, etc., or jute bagging, held in position by means of iron bars, iron channels or small I-beams. They all, however, require a greater outlay for material, and a greater expense for labor, and are at the same time, necessarily weaker than that above described.

§ 310. Miscellaneous Points: — Wherever two walls that differ more than 12″ in thickness or more than 20% in height

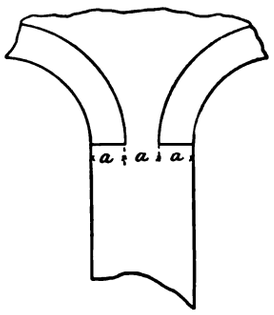


Fig. 114.

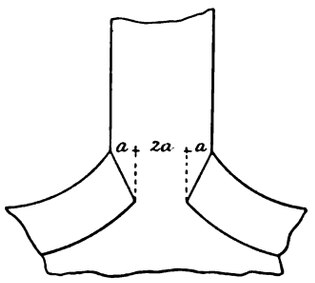


Fig. 115.

join, the joint should be made a slip-joint, and it should be carried through the foundations and footings. In skeleton construction, care should be taken to see that court-walls are separated from curtain-walls by a slip joint. Chimney-stacks should be kept separate from all other masonry walls. T-irons, channels or cast-iron plates for small spans, should be used as back lintels for all openings. In 4″ hollow-block partitions the top of the door-buck should be made with a 4″ channel-iron. Hollow brick, Haverstraw size, are worthless as furring. Experiments with new material only pay when some one else tries them. Overhanging cornices of stone, brick or terra-cotta should be thoroughly anchored with galvanized-iron anchors, carried well down into the work and with a sufficiently large plate at the bottom to hold all down. Stone sills should be supported only at the ends and the mortar should be carefully raked from under the centre until the works are nearly completed. Skew-backs for erect arches in walls should be designed so as to have ample area against crushing (Fig. 114). Skew-backs of inverted arches under piers and for the support of the footings should be made with an area equal to one-third of the pier's area, and in addition, the lines vertically up from the two ends of the skew-back should each take in one-fourth the area of the pier (Fig. 115). All arches have thrust and it must be absorbed by tie-rods, or transmitted to solid bearings by means of sloping abutments following the line of thrust, or be so decomposed by means of heavily loaded abutments as to fall within the line of the piers. Frost will destroy any mortar that is always saturated with water and alternately freezes and thaws; it is, therefore, particularly necessary that the back of all walls exposed to moisture should be coated with a damp-proof material and that ample drainage should be provided. Frost will not heave dry ground. Equalize the thickness of joints so as to secure as uniform a shrinkage as possible.

In common brickwork nine courses should lay 23″. If a wall goes out of plumb 1″ in 30′ 0″ it should be torn down at once. Cement-mortar may be mixed with salt-water without injury to the mortar. Chimney-stacks should be made with fire-clay flue-linings surrounded with an 8″, or thicker, shell above the roof and 4″ shell below. The linings should be laid in fire-clay and the shell built up independently of the linings. All walls exposed to the weather must be furred, either with 2″ furring-blocks or else with $1\frac{1}{4}'' \times 2''$ spruce lath with one course of brick brought out $1\frac{1}{2}''$ both above and below the beams (Fig. 116). Walls of ordinary brickwork shrink about $\frac{1}{16}''$ per 10′ 0″ of height. Crown all flat arches upward $\frac{1}{16}''$ per foot and see that all joints are on radial lines. If common brick is used, see that the tops are wedged off with slate chips. Avoid bond-stones in piers wherever possible; if required, then make them of the full sectional area of the pier with a thickness of one-sixth of the length and make the piers of a better quality of mortar than the rest of the work by 25%. Templates or stones to carry beams and girders should be proportioned to distribute the load over the wall, reducing the S_c to safe limits. They should be made of either 8″ or 12″ in depth, 4″ to 12″ in thickness, and either 12″, 16″ or 20″ in length. For girders carrying great loads the size will be found by dividing the total load by S_c. They should be set with full beds of cement-mortar and instrumentally levelled so as to be right to within one-eighth of an inch. Hollow walls are not a success and should be avoided: they cost more than furring. In planning for buildings, always make complete elevations of all walls and plans of all floors where there is any change either in window openings, thickness of walls or windows omitted.

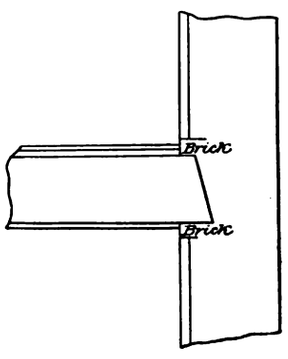


Fig. 116.

When corbels are necessary in brick walls, the corbel should not project more than one-third the thickness of the wall and the depth should equal the thickness as a minimum, each course projecting a uniform amount, and the bearing area should reduce the S_c to safe limits. If the corbel is of stone, it should be either slate, blue-stone or granite, of a thickness equal to twice the projection of the corbel. Wood should never be used in a masonry wall for any purpose; if nailings are needed they can be made with porous terra-cotta blocks. All brick and stone should be tested for porosity by being immersed in water for twenty-four hours. Hydraulic pressed-brick should gain not to exceed 1%, granite and trap 0.5%, common brick 2%, and sandstone 1%. Salty efflorescence may be helped by washing down with hydrochloric acid and painting, and then if the painting is done often enough it will cure it. All common brickwork exposed to the weather should be rendered with a Portland-cement grout, painted with oil-paint or some of the enamel paints on the market.

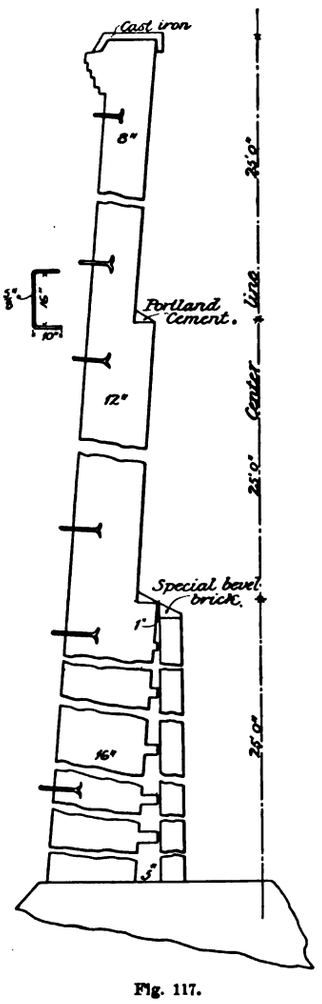


Fig. 117.

§ 311. Chimneys: — For all tall chimneys a trial section should be made, taking the walls at 8″ thick for the first 25′ 0″ from the top and increasing 4″ for each additional 25′ 0″ of height. The wall should batter 4″ per 25′ 0″ and should step off on the inside, thus making the line joining the inside edges of the steps a vertical one. Each step should be given a wash of cement.

Take wind-pressure at 50 pounds per square foot on the section of the stack, plot the pressure horizontally and the weight vertically, the weight counting from the point of intersection of a vertical line with a line of wind-pressure passing through the centre-of-gravity of the section. The resultant should pass so far from the outer edge of the chimney that the total pressure on an area equal to the area of a square whose side equals twice the distance from the resultant to the outer edge is within the limits of S_c. (Fig. 102.)

They should be built with Portland-cement mortar and sufficient time should be allowed for the mortar to set before the stack is exposed to wind-pressure, as otherwise it is likely to fall. Cap should be of cast-iron $1\frac{1}{4}''$ thick and made of as few pieces as possible. Hooks should be built in each 12′ 0″ of height, so as to permit of easy scaling should that be necessary. A lining of fire-brick 5″ thick and carried up vertically should be placed inside of the stack for a distance of 35% of the

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length of the flue, this lining should be free of the chimney and free to expand and contract, but should be kept from buckling by bricks projecting from the shell rubbing against the lining (Fig. 117). The space between the lining and the walls should be entirely closed off at the top.

§ 312. Concrete: — The treatment of concrete for foundations in the usual building construction has already been sufficiently covered. For walls of buildings, it should only be used under circumstances forbidding the use of any other material, since very few masons possess more than a rudimentary knowledge of the use of hydraulic cements, and one imperfect barrel would result in a failure, either of the surface or of the strength of a wall that would cast discredit on all of the work. Under circumstances requiring the use of concrete, as for example, Carrère & Hastings's great hotels and other buildings at St. Augustine, Fla., the services of an expert engineer familiar with the uses of concrete should be obtained, and the use of the material constantly watched. Under these circumstances, the cost is only slightly in excess of that of common brickwork.

§ 313. Mortars: — See page 9, Section VII. When a mortar of considerable strength is required, Tables II and III should be compared, but the cost of the mortar should be determined by ascertaining the price of each of its ingredients at the locality considered and making the comparison. Generally, for all cases where building-operations are carried on under the control of a building-department, or where the services of a most competent clerk-of-the-works are not to be had, it will be found better to use Rosendale-cement mortar, than Portland-cement mortar.

[To be continued.]

THE NINTH LEAGUE EXHIBITION.[1] — II.

NEXT to the Vanderbilt drawings comes a drawing of Mr. Haight's American Theatre, in New York, splendidly rendered in color by Mr. J. King James. Taken altogether, this is the finest piece of architectural rendering in the exhibition. The surfaces of the stonework are as smooth, and free from brush-marks, as the stone itself, and, while fully colored, there is nothing in the picture to call away attention from the building which forms frankly the main object in it. Near by, Messrs. De Lemos & Cordes have a design for an office-building, which is rather disappointing after the graceful and elegant work which they have given us in other buildings; and Mr. W. C. Mellen shows a competitive design in Colonial style, for a library at Augusta, Maine, which has the unpleasant, though too common, fault of appearing to have been born symmetrical, but to have taken on an abnormal development at one end.

After a tall bank-building by Messrs. Cady, Berg & See, and a nicely studied house-front by Messrs. Sturgis & Cabot, of Boston, we come to a cluster of pretty water-color sketches, by Mr. E. M. Welch and Mr. E. K. Taylor; and then reach an extraordinary design for a thirteen-story apartment-house, which contains more architecture than any design within our recollection, except, perhaps, the eccentric creation which was devised by Mr. Moser as a habitation for the American Institute of Architects, and attempted, with considerable success, to include every known style or variety of architecture. In one elevation of the apartment-house in question we find the first story marked by a portico, with enormous intercolumniations. The next story is diversified by a balcony; and at the third story start polygonal bays, framed in pilasters. This motive continues through the next story; but at the fifth story the pilasters are dropped, and bays of a new sort, overhanging the first, and of different plan, are piled on top of them. This second order of bays also continues through two stories, and is terminated in the seventh story by huge arches, under which the upper part of the bays fits rather uncomfortably. In the eighth and ninth stories, we have plain windows; and, in the tenth story, more of the same, but with a string-course attached to them. This completes what we may call the plain portion of the façade. In the eleventh story we find the beginning of a vast dormer, with a recess in the middle, and windows curiously arranged in the recess; in the twelfth story a huge arch terminates the recess, with more windows under it; and, even in the thirteenth story, the dormer is not wholly lost, a window appearing in the peak, which evidently lights a room behind it. Not far from this labored composition is a fine drawing, in black and white, of Messrs. Heins & LaFarge's New York cathedral, which loses much of its effect by the badness of the framing. The drawing seems either not to have been stretched at all before framing, or to have been stretched on a board so thin that the contraction has drawn it all out of shape, causing the lines of the subject to wave violently in various directions, to its great injury. Near this is a pretty design, in pen-and-ink, for a small Congregational church, by Messrs. Berg & Clark; and then come more colored sketches, very good, like nearly all the work of the sort shown.

By this time we arrive at the stairway leading to the basement, where we find a colored drawing of a house in New York, by Mr. Mellen, of not extremely interesting exterior, further illustrated by a large model, showing the interior, which appears to be rich and stately. We hurry by this, and are stopped by a charming little water-color, by M. Van Pelt, called "Housetop Walks, Nantucket," but which is either a careful composition, or a very nicely chosen group of old Nantucket houses, in brick and wood, ranged along a street sloping to the sea, which occupies the distance. The perspective of the difficult subject shows a skilful hand, and the grouping and color are extremely pretty.

In the vicinity of this is a beautiful pen-and-ink perspective, by Mr. J. King James, of Mr. Haight's Vanderbilt Dormitory, at Yale College. The building is in the late Gothic, or rather Transition English style which Mr. Haight manages so well, and the drawing is in perfect sympathy with the sentiment of the design.

In the same group with the last are some pretty drawings of country houses, by Messrs. Rossiter & Wright, and several nice water-color sketches, by Mr. MacCafferty, Mr. J. W. Case, Mr. H. B. Herts, and Mr. E. K. Taylor. Of these, the most of a picture is, perhaps, one of Mont Saint-Michel, by Mr. E. K. Taylor, which, for poetry and artistic feeling, deserves to go with the Nantucket sketch, and we think that is saying a good deal.

We are getting so near the limit which our judgment places on the patience of our readers that we must content ourselves, for the rest of our space, with mentioning only a few of the works which have special comments attached to them in our annotated catalogue. Among these we find another very pretty design by Mr. Haight, this time for a country school-house; some nice brick and half-timber houses by Mr. MacCafferty, Mr. Robertson and Messrs. Renwick & Aspinwall; a charming eleven-story family hotel, by Mr. Hardenbergh; Messrs. Le Brun & Son's Home Insurance Company's building; a good Philadelphia apartment-house, by Mr. T. P. Chandler; Mr. Ernest Flagg's St. Luke's Hospital, quiet and refined in treatment, and with an admirable plan; a pretty house in Albany, by Mr. George Keister; a beautiful design for an addition to a church, by Mr. Faxon, and a very pretty school-house, by Mr. F. R. Comstock, of Hartford.

It will be remembered that this exhibition includes sculpture, decorative painting, and decorative designs of various sorts, to a greater extent than ever before, but we refrain from going out of one province to criticise these, further than to say that we find extraordinary interest in four models for figures intended for the angles of the new pulpit in Grace Church, New York, by Mr. W. W. Bosworth. Mr. Bosworth being an architect by profession, his models would be interesting in any case, but they are particularly so as examples of clever adaptation of sculpture for close connection with architecture. Every architect knows that modern figure sculpture rarely accords well with architectural lines, and that the mediæval sculpture, however deficient in other respects, possesses this property to a much greater degree than that of our age; but Mr. Bosworth, while retaining the long, straight folds of drapery, and tendency to general rigidity, of the mediæval work, has joined these qualities in a curiously successful manner with the greater correctness of modelling, and more classical dignity of modern sculpture.

We regret that our notice of a beautiful and brilliant exhibition should have to terminate with a rather harsh criticism, but it seems to us that the exhibitors deserve better treatment than they receive at the hands of the Catalogue proof-readers. We have said the same thing in previous years, but the need of it is more pressing this year than ever before. It would be possible to forgive such mistakes as referring to the "Cortosa in Paria," or the "Church of Santi Spirita," or the "École de Medicin," or "Stoaksay Castle," or "San Stephano," or "L'Eté de la Saint-Martin," or describing a bas-relief of Juliet and her Nurse as "Juliet and the Muse"; but it is not so easy to excuse carelessness by which the names of contributors are disguised beyond recognition. We find, for example, Mr. William G. Preston's design for the improvement of Copley Square, in Boston, attributed to "William Gibbons"; Miss Ruggles, now Mrs. Kitson, one of the most brilliant women sculptors of the time, appears as "Miss Ruggler"; while Miss Helen Reed, another sculptor, is furnished with a middle name, as "Miss Helen Reech Reed." What appears to have been originally a pretty and noble name is tangled up and inverted into "de Veniane Renee," and Mr. Tuthill appears in two forms, as "Wm. B. Tuthill," and "Wm. B. Tuttle," the address being given as the same in both cases. In the same way, Mr. Treadwell's name is spelt after various manners, none of them correct, and Miss Janet Scudder, the sculptor of a most beautiful portrait bust, figures as "Janel Scudder." It ought to be remembered that artist contributors send their works to such exhibitions in the hope of gaining reputation, and a serious injury may be done them by mangling their names and addresses in this way, to say nothing of the discredit which such mistakes cast upon a catalogue which otherwise comes very near perfection.

[1] Continued from No. 942, page 18.

COAL IN THE UNITED STATES. — The output of coal in the United States last year is officially returned at 179,000,000 tons in round figures. In this total Pennsylvania figured for 99,000,000 tons, or more than one-half. The value of the American coal raised last year is officially computed at $207,566,381. — *Engineering.*

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THE BUILDING-OPERATIONS OF '93.—NEW OFFICE-BUILDINGS: THE MONADNOCK EXTENSION, THE COLUMBUS, THE ISABELLA, THE MARQUETTE, ETC.—THE ART INSTITUTE BUILDING.—VANDALISM AT THE WORLD'S FAIR GROUNDS.

ALTHOUGH this has been considered a dull year among architects and the work in the offices here has been very quiet, still the number of large down-town buildings which have been completed in 1893 almost seems to contradict what is, however, known to be an indisputable fact. These buildings, if not all actually begun in ninety-two, were, at least, conceived during that year. A tabulated list of the building-permits for thirteen years show that not since eighty-nine has the showing for the twelve months been so small as in this past one of ninety-three. In eighty-nine the amount of money used in building was $25,065,000. In ninety the year's expenditure summed up to $47,322,000; in ninety-one, $55,360,000; in ninety-two, $65,402,000, and in ninety-three, $31,000,000.

The new buildings down-town seem as one passes by them in daily rounds to be not so few in number; possibly, because of their mammoth proportions they force themselves upon the attention. On Dearborn Street, the centre for office-buildings, the Old Colony, Ellsworth and Boyce Buildings rise majestically, while the "Monadnock Extension," so-called, overtops them all in gigantic proportions, while in its ornamentation it stands out conspicuously from its companion the old Monadnock, which is absolutely free from any architectural effect. But little effect can be obtained in these large buildings from the street, no matter how they are treated, and it is only when viewed from some neighboring building that one can see their often picturesque arrangement of roof and upper stories. This is especially noticeable in the Woman's Temple, before described in these letters. The dignity of this building is never lost at any point, though the elaboration of detail is kept for the lower and upper stories, the intermediate ones being less pronounced. Buildings like the old Monadnock afford no possible object for admiration, and one in looking at them must always fall into the common habit of counting the stories. This building is doubtless well suited for the use for which it was intended, offices, and possibly it may be shown in the future that these mammoths, the production of the nineteenth century here in America, should be so treated to obtain the most fitting result. Certainly their main object is utility, but when utility in interior plan can be obtained in combination with some exterior architectural features, it must ever be a gain for the city in which the buildings are located. The Monadnock Extension, as well as, possibly, its neighbor the Old Colony, were the last buildings built under the old ordinance, they both being over a hundred and thirty feet in height, the limit to which buildings can now be raised. The old Monadnock is absolutely free of any band-courses, or, in fact, any division which can serve to break the monotony of its seventeen stories. Even a cornice seems to be tabooed, the only approach to one being a slight budding forth, as it were, of the outer walls at the point where they approach nearest to the sun. The Monadnock Extension is decidedly more ornate and seems to prove that an office-building may without loss of convenience or dignity be so designed. It is composed of red brick and terra-cotta, its color being an exception to the almost universal prevalence of buffs and grays, at present the colors of the materials used for large buildings. The entrances in the Monadnock Extension are very satisfactory, their chief feature being the two large, low arches, which throw deep, picturesque shadows and are, generally speaking, a fine feature. Series of bay-windows run from the third or fourth story upward, and these rest upon a well designed band-course with bracket supports. The windows are enclosed in long bays, the moulding of which is ornamented with Classical carving which is effectual without being heavy. The bays at the top of the building terminate in four arches resting on pillars, and over-topping them are windows flush with the wall.

Diagonally across from the Monadnock rises the Old Colony. In this building granite is used for the first three stories, while buff Roman brick and terra-cotta are the materials used above. The building is kept as near the Colonial style as was possible in this especial kind of structure and is very satisfactory. The main entrance leads between Doric columns, and the carvings not only around the entrance, but also in the lower stories, though not lavish are extremely refined in design and excellent in execution.

These four structures already mentioned, the Boyce, Ellsworth, Old Colony and Monadnock, were begun in ninety-two and finished last year, while in this same quarter several large office-buildings are even now in the process of construction, the new Marquette and the remodelled Equitable being chief among them. The Marquette is attracting especial notice as, to make room for it, the old Honorè Block was torn down, which not many years ago was considered one of the best business structures in the city, a substantial stone building with some little architectural pretentions. It has, however, been raised to make room for the more extensive structure, whose foundations are in part already in, the place having been roofed over and work having been carried-on on them in spite of snow and rain. It will not be long before the steel skeleton will be raised, a process which is always an object of interest to the average passer-by, because of the peculiar way in which the work is carried on—energetically on, say, the first and second stories, then three or four stories are passed by and finally we see the workmen gathering on the fifth and sixth or seventh and eighth.

Farther east, the Columbus, the Isabella and the Marshall Field buildings—some of those which were begun in ninety-two were ready for occupancy in ninety-three. The severe simplicity of the Monadnock type, it is easily to be imagined might become a relief after such riotous ornamentation as is found in the Columbus. Carvings and bronzes are introduced wherever possible and the sky-line is as far from anything reposeful as a summer sky in the midst of a cyclone. Of no defined style, turrets and domelettes gambol at will above the eaves-line, while in the chief corner construction the conventionalized meridians, in the form of an inverted hoop-skirt form, hold a gray glass globe, "a cloud by dav and a pillar of fire by night," for in it is placed a strong electric-light. The globe has a map of the world on it which is dimly discernible from the street. The building named for the discoverer of America, completed in this anniversary season, was intended for a memorial building, and there are consequently many features which recall the past. On either side of the entrance bas-reliefs in bronze of their most Catholic Majesties, Ferdinand and Isabella, repose. Above the entrance a more than life-sized bronze figure of Columbus stands on a globe. The two lower stories of the building are of metal and glass, the metal loaded with ornamentation, while above buff terra-cotta is used. The arms of Spain and possibly of Columbus—they are difficult to distinguish at the height—enter into the decoration of the upper part of building, extreme at this point in its ornamentation. Though the exterior may be lacking in good taste there are unquestionably very many charming features in the central entrance-hall, rich in marbles, mosaics and onyx. The mosaics are of Italian manufacture and are very fine. The floor of the vestibule, as well as the rest of the hall, is of this admirable work, and exhibits of the three famous vessels, "*Nina*," "*Pinta*" and "*Santa Maria*," the "*Santa Maria*," naturally, having the most prominent place. Both ships and water are most artistically treated. Around the entire vestibule are bas-reliefs of scenes from the life of Columbus. They are not aggressively poor, neither are they extremely good. Probably had the author possessed twice the reputation which he did, he would have given the work three or very likely four times as much study as was actually put upon it. The greater the artist, the longer and more conscientious his work and study seems a foregone conclusion. Within the hall two memorial tablets in a marble arcade testify to the glory of Columbus. A charmingly decorative mosaic panel on the opposite wall bears the letters Y and F. At the back of the hall beyond the four or five elevators some most quaintly picturesque winding stairs of marble and onyx lead to the floors above. Opening out of this hall both by narrow doors and wide windows are two most decorative and decorated shops. These also are rich in mosaics and marbles, and may be mentioned in detail in some future letter.

The new Marshall Field Building, though a less difficult problem to solve in the matter of stories than some of the other higher structures, and though entirely and completely loaded with ornamentation, except in the lower story, is certainly a very attractive and successful building. In the high structures the ornamentation generally is reserved for the lower and upper stories, leaving a very long stretch of bare, unattractive surface. To avoid this in the Marshall Field Building the idea seems to have been to entirely cover the pieces of terra-cotta, as it would be possible to cover stone, with carving. Two different designs enter into this decoration, one alternating with the other. The lower stories are of granite, while the upper are of terra-cotta, there being two divisions in this part of the building formed by the use of material of two shades, the darker for the stories next to the granite, while the highest ones are of a still lighter shade. The band-courses, the window-frames and, as stated above, the very face of the terra-cotta are covered with ornamentation, but curiously enough, when every thing is so decorative the result is not so distracting as would be expected, for the ornamentation is so general that a decided effort of uniformity and repose is obtained. Whatever richness of color is put into it, has been wisely kept for the interior exclusively and has not been allowed to infringe on the exterior dignity by cropping out around the windows and entrances. However beautiful richness of color, decoration and mosaics may be in certain building in certain places, they most decidedly are not suitable for structures in our ever smoke-begrimed down-town district.

The Isabella Building is another one of the new structures which offers an amount of dignified picturesqueness in its general outline, which is very pleasing. A certain carelessness is noticeable in some of the details which in so satisfactory a structure is to be regretted. The ornamentation of the upper stories is quite in the feeling of the florid Gothic, with which the entrance, which is very charming, harmonizes, but certain capitals and band-courses in the intermediate

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stories lose this character in a design not in keeping with the good work of the rest of the building.

The large structure on the corner of State and Madison, to be known as the Champaign, is strictly of this last year's construction. We are told by the papers it is to be one of the "handsomest steel structures" in the city, but the possibilities of such a result seem dubious. The lower stories are of brownish-red terra-cotta, while the remaining thirteen are of white. When we are told by the local press that "the windows will be large, and the cases and frames covered with gold-leaf," that "materials have been selected that can be easily washed," that "the intention is to make it a distinctly white and ornamental building," we tremble for the possibilities. When a thing so big is bad it becomes a serious matter. This, however, is mere speculation upon hearsay and the result may be the exact opposite from our fears, for as yet with scaffolding, etc., around the building, it is impossible to judge it. One of the remarkable features of this mammoth structure is the rapidity with which its seventeen stories have been erected. The old building was only torn down some time about the middle of last summer and now the place is entirely under roof.

The new Stock Exchange Building, now in process of construction, is one which promises to be successful. In its ornamental details it bears very distinctly the characteristics which ever mark the works of its architects, one of our best known firms. These details as usual are very charming and are at the same time very curious. When viewed from near at hand the designs seem so fine and small as to suggest that at a little distance they would become quite lost. But this is not the case, for when viewed from a block away, as in the case of the upper stories it is possible to do, they come out clear and distinct and sharp, having a much better carrying quality than design of apparently a bolder and much coarser kind. Evidently the architect appreciates the advantage of these almost purely geometrical forms treated as a design in which these qualities cannot be outdone. The work has all the mark of most careful study — no lazy open spaces are left in an indolent fashion or are filled-in with a few meaningless curves and lines which have no connection with anything else. The building is entirely of a buffish terra-cotta. A curious little episode connected with it has been the attempt to stop by injunction the placing of the lettering over the doorway. The name Stock Exchange is, of course, the name applied to the headquarters of the stock exchange and it was not considered advisable to take the chances of this possible confusion. The injunction was not, however, granted and the lettering went merrily on.

Near neighbors to this building are the New York Life (recently illustrated in the *American Architect*) and what is known as the Association Building. The New York Life is now under roof, while the Association Building, which is in part the home of the Young Men's Christian Association, was dedicated last New Year's Day. The lower stories of this building are extremely dignified and the structure generally very successful, though the upper stories lack the charm of the first ones of buff Bedford stone, while the composition of the roof is not entirely satisfactory. The Christian Association will occupy the two stories in front and two-thirds of the rear of the building. One of its chief attractions is a swimming-tank on the first floor, twenty-one by seventy-two feet, with tub, shower and spray baths and locker-rooms. There are bicycle storage-rooms with accommodations for three hundred bicycles. There is a good-sized reading-room on the second floor, a lecture-room with two hundred and fifty chairs and an auditorium with a seating-capacity of thirteen hundred.

One block west of these and a few squares south rises the huge Medina Temple. This is the home of some of the secret societies, and named for the famous Arabian town, its architecture taking on an Eastern character. How well this style is carried out is a matter that might be questioned. There is a lack of study in the design which pervades the whole and which does not yet give the most satisfactory results. The ornamentation is almost exclusively reserved for the upper stories, and the lower ones fail in dignity. Two buildings of a public character have been finished and thrown open to the public this month. These are the Art Institute and the Newberry Library. The Art Institute, as far as its exterior is concerned, was finished last spring, but has never been given over to the exclusive use of the association till now. The building is of buff Bedford stone, which unfortunately even now has lost all chance of taking on its time-growing richness of color, because of the coating of soot and smoke. The building is of the low Classic type, its outlines and proportions being excellent. A broad and most successfully laid-out flight of steps lead to a generous entrance through an arched portico. The building has somewhat the shape of the letter E, there being two long extensions running east from the western façade and enclosing between their arms a generous inner court, which gives ample light to all of the rooms opening upon it and which it is planned eventually to partially cover with the building, as the requirements of the Institute may demand that the entire design be worked out. The basement-rooms are reserved for the use of the school, and seem to be light and good, though it appeared rather a curious fact at first with all this large building, that for the actual working part of the Institute there was no accommodations, other than the basement. On the first floor proper are the rooms for the casts, the library and lecture-room, besides a central entrance-hall, from which connecting halls run north and south, from which open the other rooms. These rooms are all well-lighted by broad and generous windows, which pierce the façade on the first story. The lecture-hall had its first public trial as to its acoustics, in a lecture delivered a few days ago, and was not found wanting. On the second story over the main entrance-hall, having an open court in its centre, is a gallery reserved for some choice pieces of sculpture. Out of this, as in the first-floor arrangement, halls branch out, running north and south, from which open the galleries themselves directly connected with each other as are the down-stairs rooms. These galleries are well-lighted by sky-lights, which give curtained walls to the façade in the second story, whose possible monotony is relieved by a slightly recessed arcade. Below the frieze, where possible, a band of classic sculpture is introduced, and on the north and south ends the possible monotony of the walls is further broken by the introduction of galleries, the frieze continuing on the wall at the back of them. The decoration of the frieze itself consists of the names of painters and sculptors carved in excellent Roman lettering. The treasures of the Institute look doubly well, now they are installed in their new home, and Chicago seems to be filled with a justifiable pride over this new possession. The recent opening reception was attended with a good deal of enthusiasm and since the Fair, it does, indeed, seem as if we were on the eve of a true awakening to a better appreciation of art here than ever before. The mere fact, that in the lecture above alluded to, one on the impressionists, the lecture-room was taxed to its utmost capacity to hold the audience seems a hopeful sign. And the audience was not composed chiefly of students, but of all classes, evidently many of them gathered there with a desire to better understand "those queer blue and violet daubs" they saw last summer in so many art-rooms at the Fair.

The Institute has quite recently allied itself to the Chicago Society of Decorative Art, which now has its collection of many choice and interesting articles in some of the galleries of the Institute. These consist chiefly of rare textiles and curious embroideries, fans, jewel-work on cloth, etc. Zorn's picture of Mrs. Potter Palmer, which has been the subject for a good deal of discussion, both here and in New York, was at a recent reception of the Society exhibited here for the first time to a strictly Chicago gathering. That it is a very wonderful picture every one admits, that it is a wonderful portrait many are yet to be convinced. If the artist had no other claim than this, to be classed among the painters who are called illuminists, this one work would place him amongst the front ranks, so wonderful is the sheen on the satin gown, and the sunlight on the slightly upturned face. As a special attraction the Society exhibited a loan collection of fine portraits of women and a charming collection of miniatures.

The only excitement at what was once the World's Fair, has been caused by the behavior of the public, now that the Park is once more given over to the Park Commissioners. Naturally no entrance-fee is now asked and this removal of the small twenty-five-cent charge, which for the last few months has been made, seemed to be the signal for the vandals for miles around to rush down to the scene of last summer's brilliant spectacle. The Northern Barbarians did not descend upon Rome with more determined thought of plunder, than did these sons of a free soil flock to appropriate what did not belong to them. Poles and matting from the Java village have been carried away by men on bicycles, men on foot and women in buggies. One man is reported as being caught in the act of detaching toes from some of the sculpture around the large buildings to add to a toe-collection which he said he was making, and one man was even said to have been found who was on hand with a wagon trying to boldly and bodily remove one of the statues from the north end of the Transportation Building. Why people should thus conduct themselves it is hard to understand, especially when they commit no depredations in any of the other parks. It is rumored that the Victoria House and the Convent of La Rabida, as both being substantially built, will be allowed to stand. Certainly no more picturesque object could be found for a park than this reproduction of the old monastery, as it stands out against the lake across the artificial strip of water.

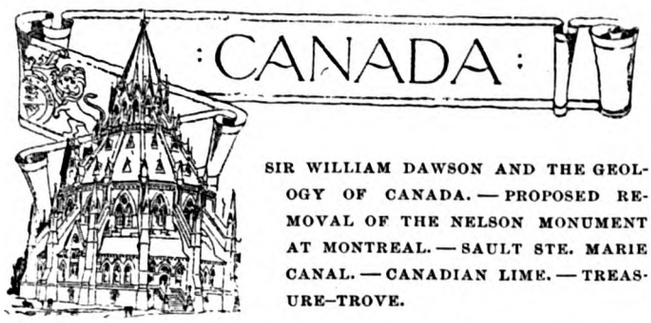
A little matter concerning these Exposition photographs once again brings this much-discussed subject before the public. Messrs. Burnham and Millet are preparing an illustrated history of the Exposition, having already put a large sum of money into it. They wish to use gratuitously the photographic plates of Arnold & Higinbotham now in the photographic bureau of the Exposition. As is well known this firm, one member the son of President Higinbotham, were granted the exclusive right to take photographs of the grounds and buildings. Each has been paid at the rate of two thousand dollars per annum and ten per cent net of the receipts from the sale of pictures. As the Exposition furnished the building and all the photographic material, it is unnecessary to say the venture has proved a successful one for the concessionnaires. President Higinbotham maintained it would not be fair to the firm to use their plates, while others of the board support Mr. Burnham in his claim. So the matter rests. The work, it is expected, will be an elaborate one and deal almost exclusively with the work of construction and architectural features of the great Fair.

It is at least one comfort that the buildings now being in the hands of the Park Commissioners, all the photographers who are so inclined, from the small boy with the snap-shot to the earnest and skilful amateur are now able to photograph the buildings, as they should have been allowed to do all summer. If the chief aim of this great show was education as maintained, nothing could have better

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served this purpose than a free distribution through all this broad land of ours of all the pictures that could have been taken of it. Two concessionnaires might have been poorer, but the public would have been far richer.

Considerable interest has been of late taken in a competition which has been going on in Milwaukee for plans for the new Public Library. Many of the Chicago architects have competed and the usual amount of grumbling customary to hear at such a time has been in the air. Insinuations of unfairness have also been abundant, though why, no one knew. Professor Ware of New York was called in to give expert advice on the jury, and this advice given has been followed. Of the five plans recommended by Professor Ware one, by a Milwaukee firm, was chosen. It is estimated that the building will cost five hundred thousand and on this the architect will receive five per cent, which is rather unusual in such public works. The four remaining architects of the five selected by Professor Ware receive five hundred dollars each, and he himself receives a similar amount for expert services, which looks as if the competition was much more wisely and fairly conducted than such affairs are usually.



SIR WILLIAM DAWSON AND THE GEOLOGY OF CANADA. — PROPOSED REMOVAL OF THE NELSON MONUMENT AT MONTREAL. — SAULT STE. MARIE CANAL. — CANADIAN LIME. — TREASURE-TROVE.

SIR WILLIAM DAWSON, who since 1855 has been President of the McGill University at Montreal and only recently resigned that important position, has published another work on the geology of Canada. Natural history and geology have been life-long studies of the Professor and he has ever advocated powerfully the complete harmony between scientific research and revealed religion. This latest work on Canadian geology he has entitled "*The Ice Age in Canada.*" Canada presents particular advantages for the study not only of the Laurentian system which gives its name to our great river, but also of the Pleistocene period. Sir William Dawson gave the results of some fifteen years' study of the Laurentian period in his book "*Acadian Geology*" published in 1855. "At that time he went to live in Montreal and his attention was given to the Pleistocene period of Central Canada, and had the advantage of working with Sir W. Logan, who had charge of the geological survey at that time, and he proceeded to explore the stratigraphy and fossils of that period. He divided the strata into three groups, Boulder clay, Leda clay and Saxicava sand, and succeeded in raising the number of species of its known fossils to about two hundred. In 1872 Sir William Dawson corrected his '*Notes on the past Pliocene Geology of Canada*' and published a small volume, now out of print, although happily the substance is preserved in a early volume of the *Canadian Naturalist.* The book now published, consists of notes on the Pleistocene Geology of Canada with special reference to the life period and its climatical condition.

"Just below the surface soil we find post-glacial alluvia and peat, on the north shore of Lake Ontario, stratified sand and gravel and, in the Belly River region, prairie alluvium. The next underlying strata, are respectively, for the first region, surface boulders, Saxicava sand and gravel with boulders in and below the sand — for the second, boulders, sand, laminated clay and upper boulder deposits; for the third, upper boulder clay. Next in order, for the first region, upper and lower Leda clay with, in both cases, marine shells and plants — for the second, stratified sand and clay, with fresh-water shells and plants, and for the third, gray sand, with ironstone nodules, brownish sandy clay, carbonaceous layers of peat, and again grays and ironstone. . . . Lower boulder clay or tile with native travelled boulders, are for the three regions, the salient feature of the fourth layer. In the east and centre Paleozoic rocks, often striated, and in the northwest, cretaceous beds underlie the Pleistocene." Sir William Dawson classifies the zones of glaciation as Laurentian, Appalachian and Cordilleran, these three being the main sources of the land ice in the height of the glacial age. In the great Cordilleran range, the changes that overtook the eastern portion of the continent assume an exaggerated form, the nature and complexity of which is illustrated by a table correlating the phenomena of the high regions with those of the plains during the ice age.

"The tendency of recent observation has been to show that the Pliocene and older subdivisions of the tertiary, cover, each of them, a much larger time than the Pleistocene, and that the close of the latter approaches more nearly to the modern or recent time than had previously been supposed." Taking it for granted, therefore, that the newer Pliocene was a continental period of long duration in which the land was more elevated than at present, and that it was in this period that the valley of the Great Lakes was hollowed out (the most ancient St. Lawrence being marked by no lake system), Sir William Dawson has reached the conclusion that the oldest of the Pleistocene deposits (the hill boulder clay), was laid down during the time in which the northern land was slowly sinking under the sea, that the Leda clay and other interglacial deposits and those that correspond with them in the northwest, belong to the time when the subsidence had been complete, while districts of various elevations remained above the surface. To this mid-glacial period again followed a second era of boulder deposits with still further subsidence. It was at this stage that boulders were borne on floating ice to the mountains. It is recorded by Dr. G. M. Dawson that such boulders have been deposited at a height of no less than 5,289 feet, which is more than 1,000 feet higher than the highest known on the eastern side of the continent, and from this depression there was gradual elevation until the second continent was built up, more extensive than that of to-day, with the southern marine fauna penetrating far north and along our coasts and great mammals, now extinct, overspreading the land. Since then there have been cataclysmic oscillations of level, and a partial subsidence still apparently in progress.

"Sir William Dawson combats the extreme views as to influence of glacier action held by some distinguished scientists, such as Agassiz and Dana of the United States, Ramsey and Geikie in Great Britain, as well as the theories of Croll and Ball as to the close of the climatical changes. The cold climate of the glacial period was in Sir William Dawson's judgment, due to the peculiar geographical condition and distribution of ocean currents. It was characterized, not so much by prevalent low temperature, as by a local occurrence of an extreme degree of evaporation and condensation. As for the time of the ice age the cumulative evidence of the mass of various data, tends to show that its cause is of apparently recent date. As for the relations to it, of the human race, the strongest case for the existence of man in the tertiary period, whether at the close of the Pliocene or the beginning of the Pleistocene is that of Dr. Mourton of the geological survey of Belgium. The discovery of fruits and bones points to certain conclusions, so that it is hard to do otherwise than admit that man witnessed two great continental subsidences, the earlier and possibly the later of which was accomplished in the Northern Hemisphere with a great access of cold. Sir William Dawson is, however, inclined to think that in all likelihood the finds of Dr. Mourton may be susceptible of different explanation. This is the merest outline of a work which in subject and treatment is of deepest interest to the students of geology." — *Montreal Gazette.*

A very strange notion, for the carrying-out of which some of the citizens of Montreal have been agitating, is the removal of the Nelson Monument from that part of the city it now occupies, which is principally French in its inhabitants, to a part which is more distinctly English. The notion has arisen as an outcome of the recent attempt to injure the Monument, but for many reasons such an idea could never be permitted to be carried into effect. In the first place it would be tantamount to recognizing a division in the city between the French and English citizens which is already too much marked and has many inconvenient results. Montreal must ever be considered as an English city — a large portion of its inhabitants may be French or of any other nationality, but they must conform to English laws and stand as citizens of an English city, and could never be allowed to make two cities out of one on account of a difference in nationality. Then, again, the Monument was erected not only by the English people there, but by the French as well, and the idea of raising a monument to the naval hero was first mooted at the time the news of his death was received in the city, and the whole population, whatever nationalities they represented, did justice to his memory by contributing to the Monument.

The great Sault Ste. Marie Canal which has been for some years in course of construction is now nearly completed. The object of the Canal is to form a passage from the Lake Superior to the Lake Huron large enough for the grain boats of the lake service. The River Ste. Marie now connects these lakes, but the "Sault" or Rapids make it unsuitable for navigation. The importance of the grain-carrying trade can hardly be realized until one has seen how large are the vessels employed. Solid steel "whalebacks" of a total length of 290 feet are the largest used, and if a stranger will contemplate this fact for a moment it will give him some slight index to size of the inland seas of North America. Three hundred feet represents the length of many ocean-vessels used for export and import service, or in other words "merchantmen," and it rather astonishes fresh arrivals when they hear our lakes are large enough for them. The masonry of the canal is now finished. The walls are 1,000 feet long, 60 feet high and 30 feet wide at base, tapering to 15 feet at the top. Col. O. M. Poe, Chief of the Staff of Military Engineers of the United States, having seen the works, has pronounced the masonry as fine a piece of work of the kind as he ever examined. Everything is now ready for the hanging of the gates, and it is expected that the canal will be opened in July next.

Canadian lime seems to be much appreciated in the Eastern States of the United States, and now if there is a change in the tariff and the heavy duty put on by the McKinley Bill is removed, Canadian lime will, no doubt, again find its way into the States in immense quantities. The tariff used to be three cents a barrel, but the McKinley Act raised it to thirteen cents a barrel. At the present time with the duty lowered again to the three cents a barrel, the

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price has fallen so much that it is selling cheaper than at any former time.

A certain farmer in the Province of Ontario decided to make some alterations to his homestead and employed some carpenters, superintending the work himself. While the men were tearing down a plaster partition they came upon two canvas bags, which were found to contain $7,000 in gold. The happy farmer was, fortunately for himself, at hand when the discovery was made. It is said in explanation of the find that years ago, an owner of the farm who had a son given to throwing away money took this means of preventing his son from getting hold of this sum; dying of apoplexy, the secret of the hidden treasure died with him.

USE OF "NEEDLES" IN TUNNELLING.

IN a tunnel recently opened just outside the great Northern Railroad terminus at King's Cross, London, the system known as "needling" was adopted in the excavation, this being the first instance of its employment in an operation of this class. The needles, which were designed and patented by a working miner named Jennings, since dead, are flat steel bars about ten feet long, six inches broad and two inches thick, and they were used instead of timber to support the roof of the tunnel while the arch was being bricked-in below. Although the tunnel at King's Cross is only 530 yards long, its construction was attended by serious practical engineering difficulties. It had to be carried under a canal without interfering with the navigation, under numerous lines of metals and turn-tables in constant use without stopping the traffic, and under goods sheds, a potato market and other heavy buildings, supported on iron pillars and then brick foundations, and some of them carrying very heavy iron girders. Moreover, the line of the tunnel was very near the surface, some portions having as little as five feet six inches of soil above them.

In such shallow soil to have made an open cutting right through, bricked-in the tunnel and then covered in the earth on the top, would have been the simplest method of procedure. But under the conditions above described this was quite impossible. The ordinary alternative was to drive the tunnel under support of timber, but this would have been both costly and dangerous, for it would have involved the use all through of timber not less than fifteen inches square, while the excavation must have been extended beyond the dimensions of the tunnel to allow for the drop of the timber before the crown of the arch could be built-in.

By the use of the needles, however, timbering overhead was entirely dispensed with, and the tunnel-arch bricked and concreted close up to the undisturbed soil above. The way in which this was carried out is as follows: A shaft was sunk in the proposed line of the tunnel, and in the open cutting thus made a portion of the arch was built-in. Upon this arch two rows of needles were laid. The needles are grooved about an inch from each side, and are so shaped that they can overlap and lock into one another in such a way that no weight from above can displace them. Headings were next driven off in the front and rear of the open cutting, and as the miners advanced the excavation the needles were driven forward by a jack-screw to support the soil above. The headings were made in lengths of about six feet at a time, and thus the needles being ten feet long, could support the roof and at the same time have a firm stay on the brickwork behind. When each length of excavation was completed, the bricklayers came in and built-in the tunnel beneath the needles. Then the excavation re-commenced and the needles were driven forward once more. The shaft being, as we have said, double-faced, the work proceeded in two directions at once, the miners working in one section while the bricklayers worked in the other, and *vice versa*. For each section one set only of needles was used from beginning to end of the work, and as there is practically no wear or tear to them the same will probably be used again in other tunnels. The saving effected in timber for every inch of the work was very great. Moreover, nearly two feet less of excavation was needed and no costly mass of wood was left in the ground to rot away and cause serious subsidences in the future. The tunnel was driven from four shafts, the two central ones having two faces each. The time saved by this method is not a considerable item, but the tunnel has been driven in very shallow soil and under very heavy buildings without the least interruption to the traffic overhead or damage to any of the property undermined.

C. H. G.



MINNESOTA CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

AT the last annual meeting of the Minnesota Chapter of the American Institute of Architects, the following officers were elected to hold office for the current year:

President, Cass Gilbert; *Vice-President*, Geo. E. Bertrand; *Secretary* and *Treasurer*, Clarence H. Johnston.

The election of directors and the appointment of committees for the various branches of Chapter work has been fully perfected with a large promise of fruitful results.

The Chapter numbers thirty members on its rolls, and being well organized and energetic, it is fair to presume that the various activities in which it is engaged will make an exceedingly creditable showing when the year book is made up.

Meetings are held monthly alternately in Saint Paul and Minneapolis, at which papers are read and discussed, interesting professional data compared, and reports of committees on legislative matters, current work, and draughtsmen's competitions received. The draughtsmen's competitions inaugurated last year have been so successful that they will be continued during the current year.

The field is ripe for harvesting much that is of benefit and value to the profession in Minnesota, and the Chapter, recognizing its opportunities, expects to accomplish correspondingly large results.

C. H. JOHNSTON, *Secretary*.

SOUTHERN CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

AT the meeting of the Southern Chapter of the American Institute of Architects, held January 10, the following officers were elected:

President, M. J. Dimmock, Richmond, Va.; *Vice-President*, Thomas H. Morgan, Atlanta, Ga.; *Secretary* and *Treasurer*, W. P. Tinsley, Lynchburg, Va.; *Directors*, C. C. Burke, Memphis, Tenn.; L. F. Goodrich, Augusta, Ga.; F. T. Walker, Montgomery, Ala.; C. C. Wilson, Roanoke, Va.; Theo. M. Abrahams, Charleston, S. C. Memphis, Tenn., was selected as the next place of meeting. The Chapter was banqueted by prominent citizens of Augusta on the following night.

AMERICAN INSTITUTE OF ARCHITECTS. — MEETING OF THE BOARD OF DIRECTORS.

THE first meeting of the Board of Directors for the year, was held in New York on Monday and Tuesday, January 8 and 9. There were present, President D. H. Burnham, First Vice-President George B. Post, Second Vice-President Levi T. Scofield, Treasurer Samuel A. Treat, Secretary Alfred Stone, and Messrs. E. M. Kendall, R. M. Hunt, C. F. Schweinfurth, George A. Frederick, George W. Rapp, W. G. Preston, R. W. Gibson, W. W. Clay, J. F. Baumann, A. F. Rosenheim, Jas. W. McLaughlin, W. S. Rames, W. C. Smith, C. F. McKim and Thomas Hastings.

The result of the last letter-ballot was announced and W. P. Ginther of Akron, Ohio, and Clellen Waldo Fisher of Worcester, Mass., were declared elected, and the Secretary announced the deaths of James P. Johnson of Ogdensburgh, N. Y., and Alpheus C. Morse of Providence, R. I. The resignation of J. C. Plant of Minneapolis, because he was no longer engaged in the practice of architecture, was received and accepted and a communication was received from the Buffalo Chapter in regard to the relation of the Chapters to the Institute, which was very fully discussed and the whole matter was referred to a committee of five to report at a meeting of the Executive Committee to be held sixty days, at least, previous to the next annual meeting, and they were requested to communicate with as many members of the Institute as possible and to report such changes in the By-laws as they deemed expedient. The Chairman announced as members of this committee, E. H. Kendall, New York City; R. W. Gibson, New York City; E. A. Kent, Buffalo, N. Y.; J. W. McLaughlin, Cincinnati, Ohio; W. L. B. Jenney, Chicago, Ill.

A communication from the Buffalo Chapter was received containing a wood-cut purporting to be a representation of the "proposed Federal Building for Buffalo, from the Supervising Architect's drawing," three clippings from the Buffalo *Courier*, and a series of resolutions concerning the Federal Building Law.

After an examination of the drawing and a consideration of the resolution and the newspaper clippings, it was voted that the Secretary be authorized to draw a memorial and resolution in regard to the Buffalo building and that they be prepared to present the same to the Board at its next adjourned meeting for consideration.

At the adjourned meeting held on the next day, the Secretary presented a draft of a letter to be sent to the Secretary of the Treasury, Hon. John G. Carlisle, which was referred to a committee — Mr. George B. Post, Mr. C. F. McKim and the Secretary, who subsequently reported a modified letter which was unanimously adopted and signed by all of the general officers and by the members of the Board present, twenty in all, and forwarded to the Secretary of the Treasury by Messrs. Clay and Treat of Chicago. The Secretary was directed to send a copy of the communication to every Chapter of the Institute with a request that they take such immediate action thereon, as may seem to them best.

The Board received and acted upon eighteen applications and the Secretary was directed to issue a letter-ballot for the election of the following, as Fellows of the American Institute of Architects — William Schickel, Frederick W. Perkins, C. P. Baldwin, G. E.

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Harding, J. W. Moulton, A. Page Brown, Joseph Wolf, J. H. Duncan, Jas. Brown Lord, J. O'Connor, R. W. Gilbert, W. Chamberlin, J. S. Barney, W. T. Gooch and J. G. Stearns.

Mr. P. B. Wight having resumed the practice of his profession, was transferred from Corresponding Member and was duly reinstated as a Fellow of the Institute. The following persons upon the nomination of the President, were elected to act with the President, D. H. Burnham, Treasurer S. A. Treat and Secretary Alfred Stone, as members of the Executive Committee, viz: E. H. Kendall, C. F. McKim and R. W. Gibson of New York, and W. W. Clay of Chicago. It was voted to present the name of W. P. P. Longfellow to the next annual convention as an Honorary Member.

The matter of proposing J. S. Walker of Samoa, as a Corresponding Member was referred to the Executive Committee.

A communication of D. W. Gibbs of Oklahoma, in reference to a change in the By-laws in regard to members incapacitated by ill-health from active professional practice, was referred to Committee on Constitution and By-laws.

By the vote of the last annual convention, New York was selected as the place for the next annual convention of the Institute, and the Board appointed October 15, as the date for opening the same.

The appointment of a Committee of Arrangements was referred to the Executive Committee.

Messrs. R. M. Hunt, Geo. B. Post and E. H. Kendall were appointed a committee to collect data with regard to the early organization of the Institute and its acts to the time of its consolidation with the Western Association of Architects, said committee to be empowered to supply a clerk if necessary for the purpose.

The Secretary was directed to print a form for Chapter reports.

Messrs. Post, Hastings and McLaughlin, were appointed a committee to prepare rules to govern competitions, and to report them to the Board of Directors before the next annual convention.

Messrs. Napoleon Le Brun, T. M. Clark and Alfred Stone, were appointed as members of a joint committee on better fire-protection.

Mr. Kendall read a communication from Baron von Geymuller on his proposed "*Thesaurus of Architecture*" and urged that the subject should enlist the interest of the Board, and through them subscribers be obtained from the public libraries and persons of wealth throughout the country. Adjourned.

Alfred Stone, *Secretary.*

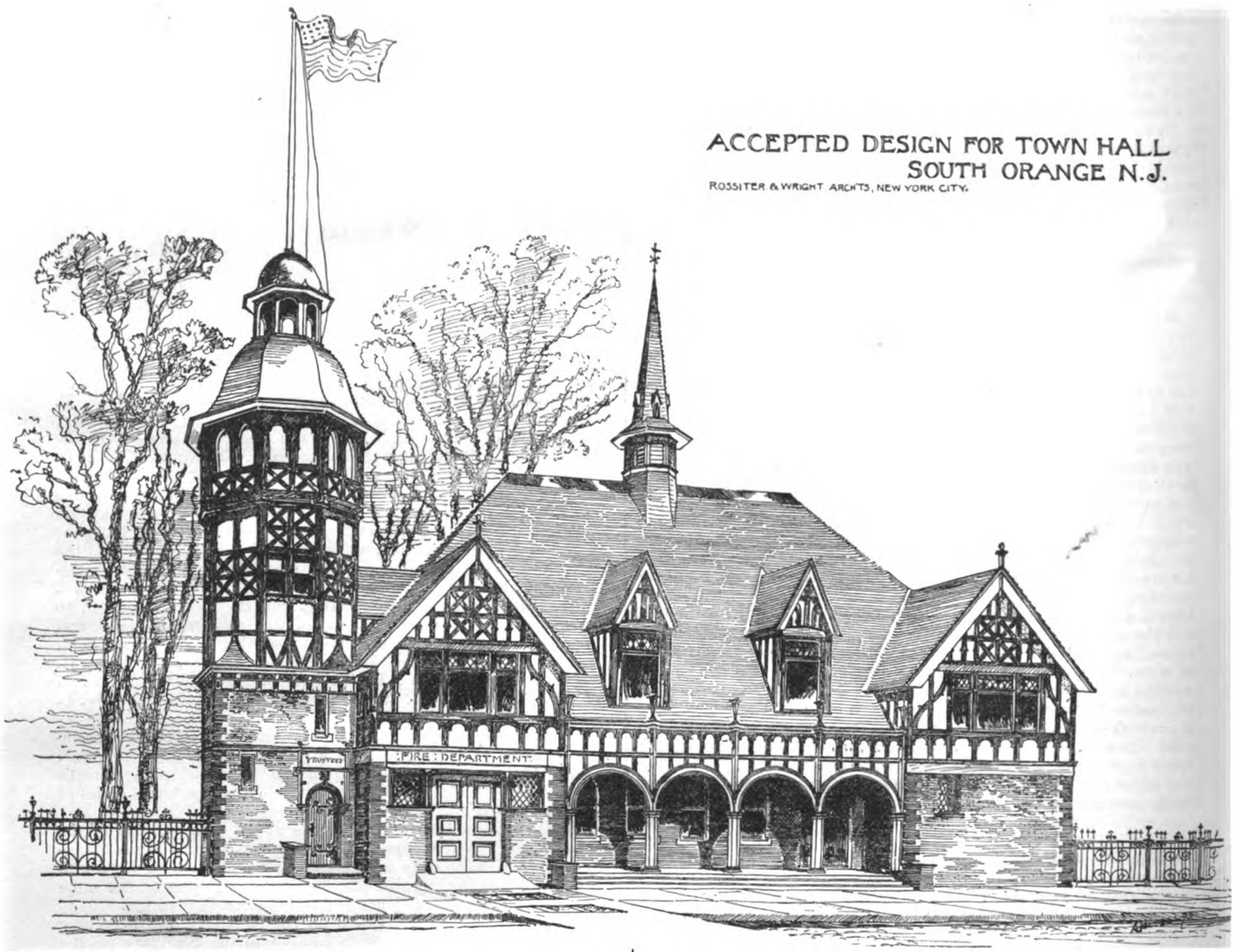
Illustrations

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

PEDIMENTAL GROUP FOR THE PENNSYLVANIA RAILROAD-STATION, PHILADELPHIA, PA. MR. CARL BITTER, SCULPTOR, NEW YORK, N. Y.

[Gelatine Print issued with the International and Imperial Editions only.]

THIS half-scale model was shown at the late exhibition of the Architectural League where it held an important place in the large inner gallery. While the modelling is very effective and in parts the composition gracefully conceived and well carried out, we cannot entirely admire the composition as a whole, as it wilfully throws into confusion the architectural movement of the feature the sculptor was called on to decorate. The general movement of the groups of centaurs, forming as it does a species of inverted arch in violent opposition to the arc of the pediment-mouldings, suggests that the groups were really modelled in the first place, each to occupy the space filled by the other and at some later date were transposed without other reason than to attract attention. The statues of the "Dancing Boy and Girl" are by Mrs. Kitson.

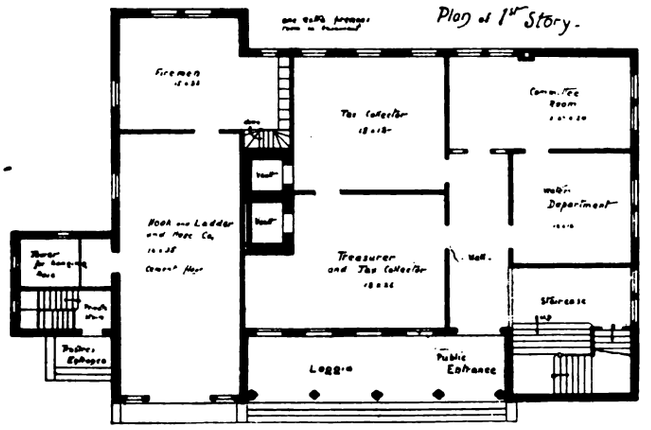


TOWN-HALL, SOUTH ORANGE, N. J. MESSRS. ROSSITER & WRIGHT, ARCHITECTS, NEW YORK, N. Y.

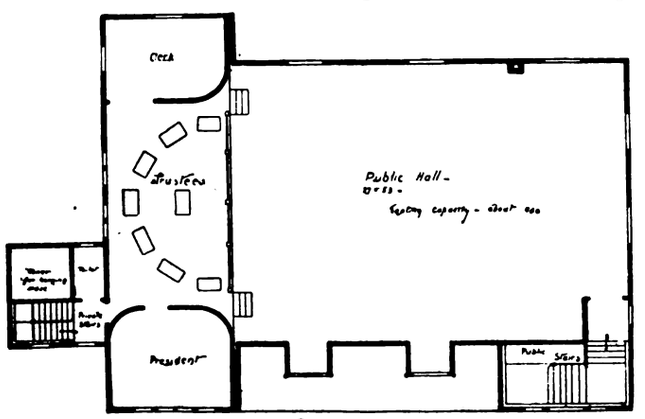
The foundation will be stone and the walls of the first story will be of brick with pressed-brick corners. The balance of the exterior will be in half-timber work with Portland cement on wire-lath between the panels. The style of the building being suggested by the half-timber work of England and Germany of the Elizabethan period. On the south corner a tower will rise to the height of fifty feet, surmounted by a belfry, beneath which the fire-hose may be hung to dry. The basement will be almost entirely above ground, and will be lighted from the rear. One room in this will be finished for the firemen in addition to their meeting-room on the first story. Toilet-rooms are provided in the basement for the

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first-story offices, and provision is made for coal storage, also two large fireproof vaults with iron doors for the storage of documents. The first story provides accommodation for the fire-department by a large room, sixteen by thirty-five feet, sufficient in size to accommodate the truck and the hose-carts. The firemen's room is directly in the rear of this, and communicates by private staircase with the second room below. The floor of the hose-room is filled-in solid up to the first story, finished with cement and provided with a drain so that water used in cleaning the apparatus can be easily carried away, without rotting the floor beams. The walls will be wainscoted about seven feet high; the firemen's quarters connect with the tower and



belfry. In the first story are provided offices for the village treasurer and water superintendent, a committee-room for the trustees, and one extra room is provided in case the township committee wishes to install the township collector in the town-hall. The entrance to this part of the building is under a loggia which will have a cement floor. This opens on a hallway, from which rises the main staircase, six feet wide and well-lighted at the bottom and top,



Plan of Second Story.

on the right as you enter the building. The second story contains the meeting-room of the Board of Trustees, which will be a large hall comfortably seating about 350 people. The stage is so arranged that it can be completely shut off by means of sliding-doors from the main floor. The auditorium will have an open-timber roof. The president and clerk will each have a room communicating with the trustees' room and to all this part of the building access may be gained by a private staircase in the tower which may be utilized with convenience when the main hall is rented. A toilet-room for the trustees is also provided on the second story. The entire building will be heated by steam, and lit by gas.

THE CASINO, WOODLAND ST., HARTFORD, CONN. MESSRS. HAPGOOD & HAPGOOD, ARCHITECTS, HARTFORD, CONN.

THIS is to be the social rendezvous for the families on Asylum Hill. It is arranged so that the assembly-hall can be rented without interfering with the people in the club-house proper, affording facilities for dancing-parties, theatricals, etc., with or without the use of the supper-room or banquet-hall. This does not interfere with the use of the whole floor for the casino assemblies when so desired. Billiard-tables for ladies and non-smoking gentlemen are provided on the second floor; and in the high and well-lighted basement are the tables for those who wish to smoke. Work on the building will be begun in the spring as soon as frost is out of the ground, and it is hoped to use the building and its courts for the annual tennis tournaments of the Hartford Lawn Club in August.

DESIGN FOR A SCHOOL-HOUSE AT AMITYVILLE, L. I. MESSRS. J. G. GLOVER AND H. C. CARREL, ASSISTANT ARCHITECTS, BROOKLYN, N. Y.

STORE FOR THE KAMPMAN ESTATE, SAN ANTONIO, TEX. MR. J. R. GORDON, ARCHITECT, SAN ANTONIO, TEX.

HOUSE FOR FRANCIS D. LEWIS, ESQ., WISSAHICKON, PHILADELPHIA, PA. MR. R. G. KENNEDY, ARCHITECT, PHILADELPHIA, PA.

PROPOSED COUNTRY HOUSE. MR. MANLY N. CUTTER, ARCHITECT, NEW YORK, N. Y.

PROPOSED DECORATION FOR DIRECTORS' ROOM, CORN EXCHANGE BANK, NEW YORK, N. Y. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.

[Additional Illustrations in the International Edition.]

PORTION OF THE WEST FRONT OF THE MUSIC-HALL, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. CHARLES B. ATWOOD, ARCHITECT, CHICAGO, ILL.

[Gelatine Print.]

FOUNTAIN OF VENUS, NEAR FLORENCE, ITALY.

[Copper-plate Etching.]

THIS fountain, the work of Tribolo with a crowning statue by John of Bologna, is in the garden of the Villa della Petraja.

HALTON, ENG.: GRAND STAIRCASE.

NEW BUSINESS PREMISES, LEGGE LANE, BIRMINGHAM, ENG. MESSRS. ESSEX, NICOL & GOODMAN, ARCHITECTS.

THESE premises have recently been erected. The elevation is carried out in red pressed-brick with terra-cotta dressings supplied by Mr. Edwards, of Ruabon.

ST. COLUMBA CHURCH, WANSTEAD SLIP, ENG. MR. E. PRIOLEAU WARREN, ARCHITECT.

THE illustrations show the exterior of the new church of St. Columba. A view of the interior appeared in *American Architect* of November 18, 1893.

TOWER, ST. GILES'S CHURCH, NEWCASTLE, ENG.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

THE NEW YORK CITY-HALL COMPETITION.

NEW YORK, N. Y., January 16, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — The six plans selected by the Advisory Committee for the consideration of the new Municipal Building Commission were described and commented upon, in the report, simply in numerical sequence and without regard to relative merit. The numbers put upon the portfolios as received were all changed later, and, so far as I know, no plan has yet been identified. Your editorial is misleading in these respects.

Yours very truly, EDW. H. KENDALL.

NOTES AND CLIPPINGS

HELPING STREET-CARS UP-HILL. — A trolley line in Oil City, Penn., climbs a grade of nearly 14 per cent for almost 1,000 feet in one part of town. John B. Smithman, president of the company operating this line, has invented and patented a scheme for helping the cars up and down this slope. It consists of a counterpoise, lowered in a well, and connected by cable with the cars. A well is now being bored for this purpose, and is nearly finished. It is sunk from the top of the hill, and will go to a depth of 1,000 feet. The "balance," as it is called, will be a cylindrical iron bar, 4¾ inches in diameter and 40 feet long. A single car, Mr. Smithman estimates, weighs about seven tons, but, on a 14-per-cent grade, it would require only one ton of vertical pull in the well to counterbalance it; and that is the weight so employed. A cable, running over a big, stout pulley, will connect the counterpoise with the car; and only one car at a time will be helped either up or down the hill; and, obviously, after an up trip the next one must be a down trip. The cable is attached to a "grip" on the car, and will run in a conduit. Mr. Smithman has invented a "differential" drum, which should render a hole half as deep as the grade is long available, but he will not use it in this first experiment. He has also thought of having a series of holes and weights where a grade is very long. — *N. Y. Tribune.*

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The New York City-hall. — Fortunately for its reputation our excellent contemporary, *Garden and Forest*, does not often indulge in such silly diatribes as this concerning the New York City-hall competition: — "The proposal to erect a new Municipal Building in City-hall Park offers another opportunity for the Municipal Art Society to step in to protect the people from the vandalism of the city government. In deference to public opinion, a committee of architects have been empowered to examine a hundred or more proposed plans, and they reported that not one of them all was worthy to be considered. His Honor the Mayor then inquired if the commission could not shuffle up the different sections of half-a-dozen of the best plans and patch them together so as to make an appropriate building, and, oddly enough, Mr. Le Brun, chairman of the commission, thought that this could very easily be done. Of course, it is absurd to suppose that any monumental building was ever put together in this way. Does any one imagine that St. Paul's Cathedral or the Capitol in Washington could have been designed after this fashion? Suppose Mr. Atwood, instead of developing the beautiful Art Building in Jackson Park, and directing its growth from one central and commanding thought, had dovetailed together pieces of the other buildings, and then put a roof over them — does any one imagine that the result would have been satisfactory? Of course, a municipal building constructed on the principle advocated by Mayor Gilroy would be a disgrace to an enlightened people; and yet, in order to perpetrate this outrage, it is proposed to tear down the one public building in the city of which every one is proud, and which is hallowed by the memories of a century. Besides this, the new monstrosity would cover up the only strip of grass on Broadway between Bowling Green and Union Square — that is, on two and a half miles of the most frequented part of the principal street of the principal city of the New World; and that, too, when the lofty buildings which are piling up about City-hall Park will make its immediate neighborhood the most densely populated spot in the world. No tenement district can compare with it in population during the daytime, and yet the city is tearing down blocks in other parts of the city in order to provide small parks for the people. In no spot on Manhattan Island, certainly, is there more need of open space and a glimpse of verdure than there is about the City-hall. Surely the Municipal Art Society, the Historical Society and every other organization of people who make any pretence to cultivation or refinement, and every man or woman who has the slightest regard for the history, the honor, the health or the beauty of the city ought to protest against this backward step toward barbarism."

The Disinfecting Power of Sea-water. — The most wonderful stories are told of the disinfecting power of sea-water, after electrical treatment, as exhibited at Havre, where experiments upon a large scale have been made under the direction of M. Hermite, the inventor of the system. The following is an extract from the special correspondence of the *London Standard*: "A central station for the proper electrolyzing of sea-water has been established at Havre, on Quai Lombardie, near the Angoulême Bridge, and pipes in connection with it had been laid through all the streets of the St. François quarter, inhabited by some twelve thousand people of the poorest classes, and formerly the hot-bed of every infectious disease. The electrolyzed sea-water forced through the pipes had, however, effected a marvellous change. The streets watered with the disinfecting liquid, by means of hose connected with the pipes, had lost that putrid oder which formerly made them not only repugnant, but an ever-present danger in the very centre of the town. In addition to this, two of the most insalubrious houses in the district had been chosen by M. David, the town architect, for the application of the Hermite system to dwellings. One of them was situated No. 24 Rue de la Fontaine, and the other 35 Rue d'Edreville. A large tank, connected with the electrolyzed sea-water mains, had been placed at the top of each of these six-story buildings, and pipes from the tank carried down to flush the closets and sinks on the various floors. In the case of the house No. 24 Rue de la Fontaine, the now odorless water from the syphons of the closets and sinks was conducted through pipes to the street gutter, down which it ran some distance before it ultimately fell into the sewer. The object of this arrangement was to offer the public a constant, visible, and olfactory proof of the purifying qualities of electrolyzed sea-water. The disinfecting liquid, so to say, consumed the sewage matter, as well as the microbes it contained; and in passing along the gutters and through the sewers, it contributed to the disinfection of both of them by the chlorine it still contained. With the Hermite system, all the sewage water could, without inconvenience, be allowed to flow into the sea, or even into rivers, for it purifies instead of contaminates them." — *New York Evening Post.*

Sea-water for Fire-service again Recommended. — The fire-commissioners of Boston recommend a plan for using water from the harbor to extinguish fires in the business part of the city. It is proposed to lay mains through the district, and in case of fire to force water into them with the two fire-boats. These two boats, one of which has been built and an appropriation made for the second, have a combined capacity of 13,000 gallons of water a minute. This would equal twenty-four second-size land-engines, and would furnish sufficient pressure anywhere in the district for ten streams for each boat. A plan somewhat similar is already in use in Cleveland and Detroit. It would seem to recommend itself to all cities whose fresh-water supply is at times seriously impaired by droughts. — *Fire and Water.*

Gallo-Roman Remains in the Department of Sarthe. — Excavations in Oiseau-le-Petit, Department of the Sarthe, France, have revealed a Gallo-Roman city which appears to have been destroyed by an earthquake. The city probably contained about 30,000 inhabitants, but its name is not known in French history. The ruins include a great temple, part of which is still standing; also a theatre and monuments. A number of medals have been found, which include one of the time of the Emperor Constantine. — *N. Y. Evening Post.*

Original Drawings of the Elder Architects. — It is probable that the unique collection of original drawings by Inigo Jones, Palladio, and others, lent by the Duke of Devonshire to the Royal Institute of British Architects, may be retained permanently by that body. — *New York Evening Post.*

A deserted Washington Town. — A gentleman who has just returned from Gray's Harbor City, Wash., states that there are upward of one hundred buildings there, but they are all deserted. A few fishermen dwell near the shore in their own rude shanties. Some of the deserted buildings are handsome structures, one business block having cost upward of $20,000. — *Exchange.*

Boston's Fire Record. — The fire record for the year just completed shows that the total number of fire-alarms during the twelve months has been 1,536, with an estimated gross loss of $5,706,000. There were 34 deaths and 111 persons injured by the fires. Out of the number of alarms given, 39 were false alarms, 19 seconds, 6 thirds and 1 fourth and 1 general alarm. — *N. Y. Evening Post.*

Settling of the Chicago Board of Trade Building. — It has been decided to demolish the big tower of the Board of Trade Building in Chicago, as it has sunk eight inches, and is threatening the rest of the structure. New bonds will be issued to provide money for the proposed repairs. The tower is 325 feet high. It is possible that a tower of light material will replace it. — *New York Evening Post.*

The Lightning-rod in Egypt. — It was said a little while ago, that an obscure Hungarian priest was the inventor of lightning-rods, and not Benjamin Franklin. Now a German Egyptologist, Herr Heinrich Brugsch, claims that he has ample proof that the ancient Egyptians used a form of lightning-rod for protecting their temples against discharges of atmospheric electricity, and that Franklin merely re-invented the same device. But, until he can also prove that Franklin was aware of what the ancient Egyptians had done in this direction, the American is just as much entitled to be regarded as an original inventor. — *Invention.*

An Old Mexican Aqueduct. — One of the oldest aqueducts in Mexico was built a century and a half ago to supply the City of Queretaro. This aqueduct, which bridges water five miles, has seventy-four impressive arches, through one of the highest of which the tracks of the Mexican Central Railroad pass. The Mexican aqueducts were not arranged to deliver water under any considerable pressure; they either supplied a series of gutters passing through the town, or discharged the water under light pressure at fountains, whence it was carried in vessels on the heads or backs of women, on the backs of burros, or on wheelbarrows or carts especially arranged for the purpose. There seems to be a considerable opening in the near future for hydraulic engineering in the republic of Mexico. Very few of the more important towns have water brought and distributed under pressure, and as advancements are made the number of those which provide for a water-supply will probably increase. The City of Mexico has lately contracted for additional water-supply, and an English contractor is now completing a gravity system under high pressure for the City of Pachuca. — *The City of Mexico Two Republics.*

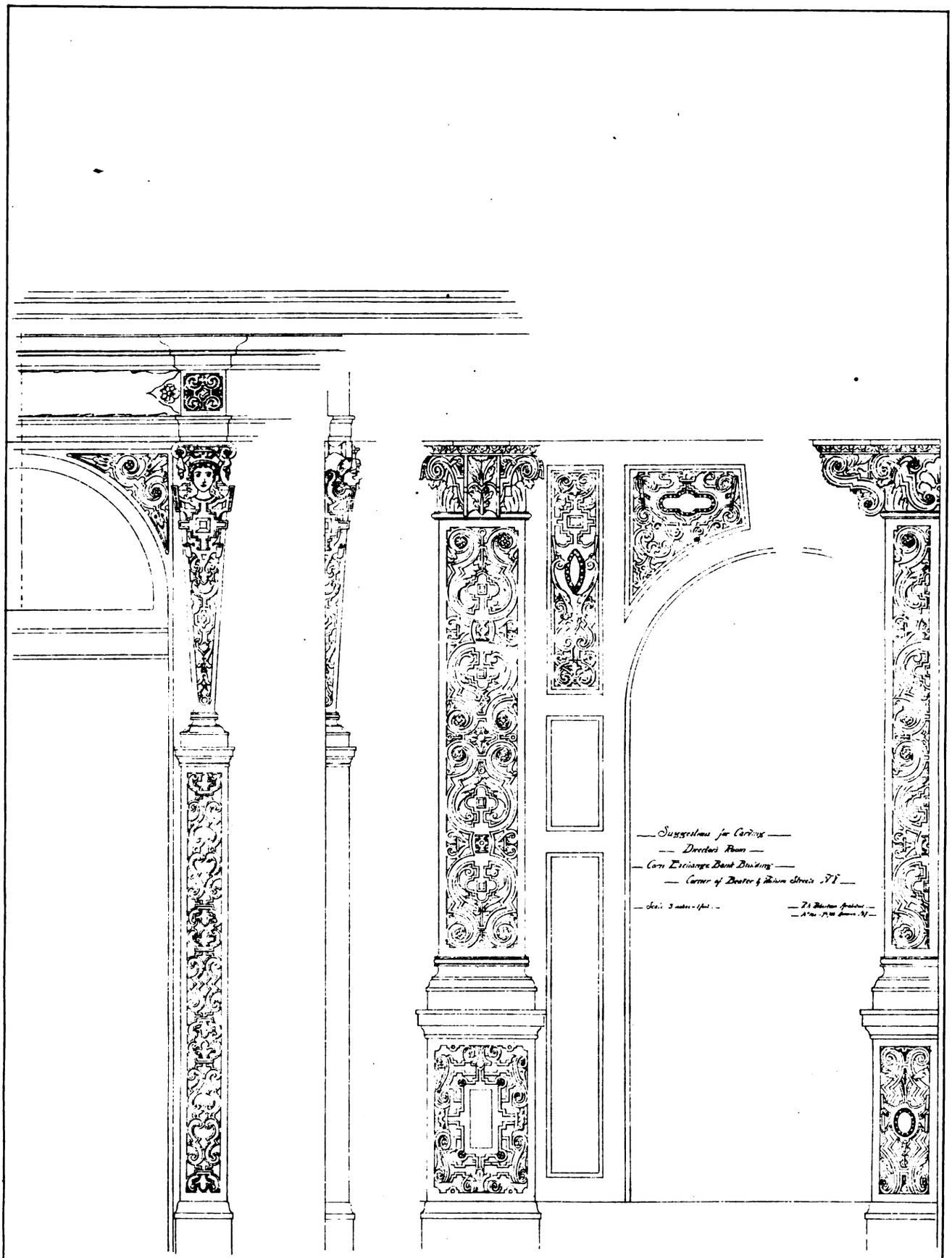
Five Years under the Zone Railroad System. — It is five years ago since the Hungarian Government decided to apply the "zone" system to its railways. Taking Budapest as the central point, a circle with fifteen miles radius was drawn about it; beyond that another circle was described with twenty-four miles radius, and so on up to eleven circles. The twelfth and thirteenth circles each included a "zone" of fifteen miles, and all the rest of the country made the fourteenth "zone." At the same time, fares were reduced, on an average, 50 per cent. A person wishing to go anywhere within the first zone, fifteen miles from Budapest or less, pays twenty cents first-class, sixteen cents second, and ten cents third. This rate is doubled for the second zone, anywhere within twenty-four miles, tripled for the third, and so on to the end. The result is now published. It shows an increase of passengers, upon the whole, to the amount of 216 per cent, and of receipts to the amount of 40 per cent. These returns exceed the most sanguine expectations. Now that the experiment has turned out so profitably, the directors of private railway corporations in other countries may feel disposed to imitate it. In this instance, at least, it seems clear that both the public and the State treasury have been benefited greatly. — *N. Y. Evening Post.*

Comparative Cost of Theatres per Seat. — The latest addition to the numerous playhouses of Vienna is the new Raimund Theatre, which has been erected in the Mariahilf district, and is intended for the representation of classical drama at popular prices. Its auditorium, which measures 22 metres by 20 metres, or 72 feet by 65 feet, holds an audience of about 1,800, half of which number have seats on the floor of the house. The cost of the building, for which Herr F. Roth acted as architect, was 450,000 florins or 37,500*l.* Only nine months were required for its erection. Referring to the financial aspect of this "people's theatre," our contemporary, the *Deutsche Bauzeitung*, publishes some interesting data on the cost per seat of the largest theatres of the Continent. A seat in the Paris Opera House cost 16,466 francs, or 658*l.*: in the Vienna Opera House, 2,000 florins, or 166*l.*; in the Budapest Opera House, 2,525 florins, or 210*l.*; and in the Frankfort Opera House, 2,356 marks, or 117*l.* The seats at the Schwerin Theatre cost 125*l.* each; at the Bruenn Theatre, 35 *l.*; at Rouen the figure was 40*l*, and in Halle and Berlin 49*l.* and 60*l.* respectively. At the Worms People's Theatre the cost was, however, reduced to 25*l.* 15*s.* per seat, and at the new Raimund Theatre to about 21*l.* 5*s.* English figures are, unfortunately, difficult to obtain. — *The Builder.*

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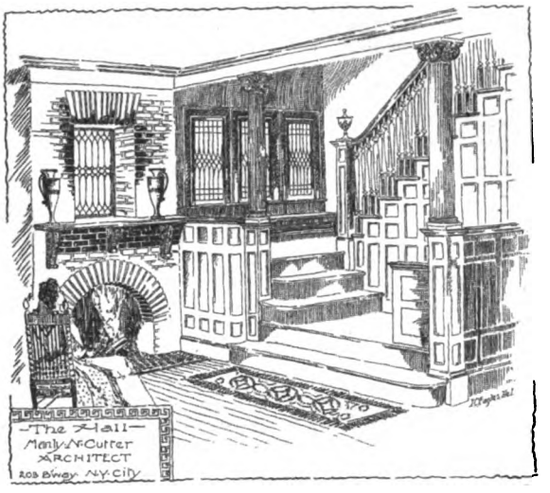
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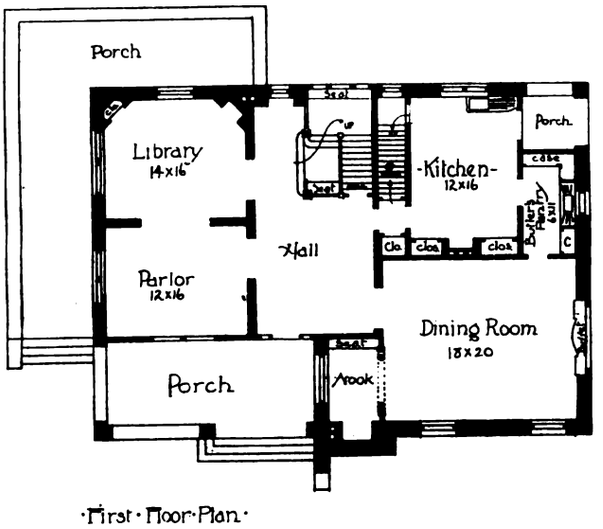
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Proposed Country House

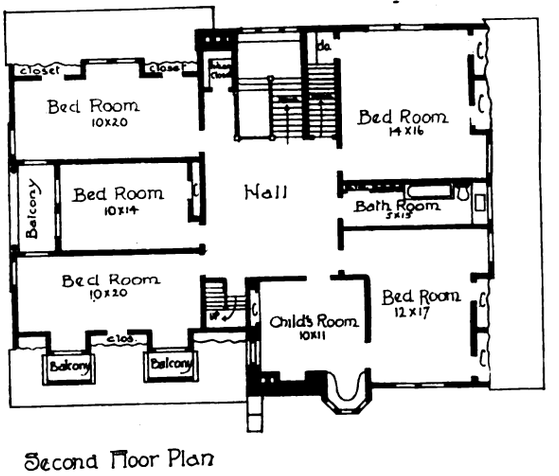
Manly N. Cutter
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First Floor Plan



Second Floor Plan

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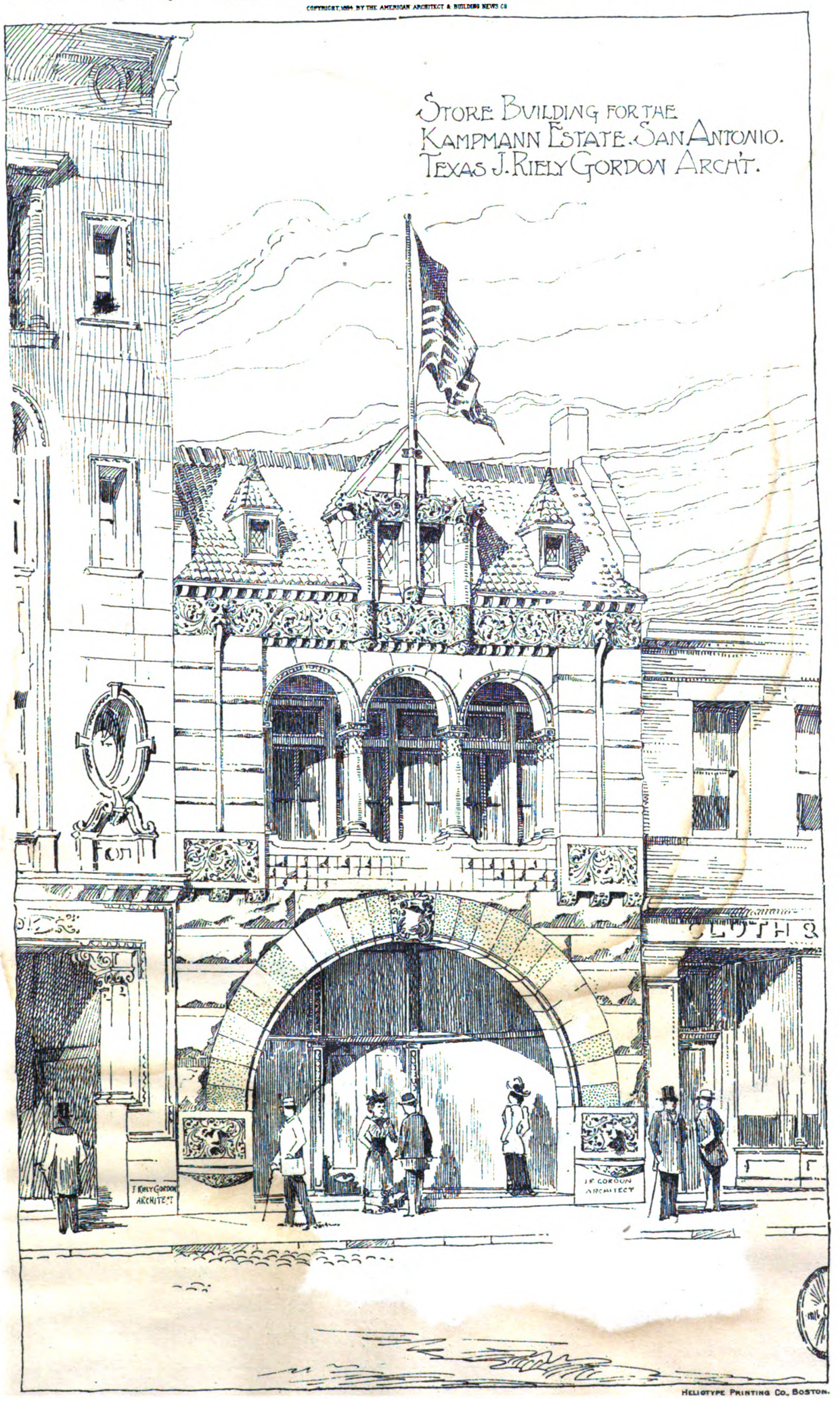
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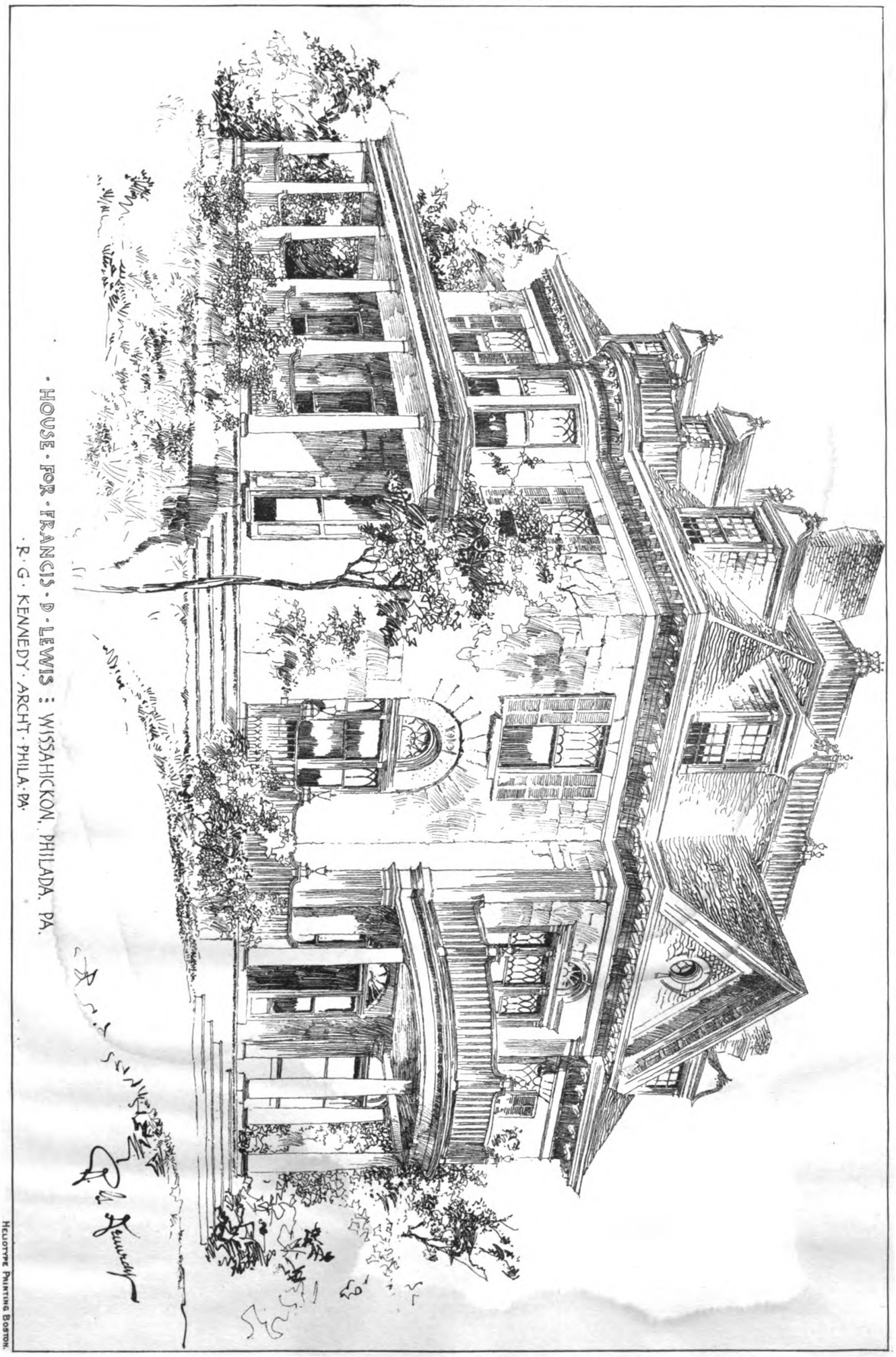


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THE profession of architecture has suffered a great loss, in the death of César Daly, who passed away at his country house, at Wissoux, near Paris, a few days ago. Daly was born at Verdun, in Northern France, in 1811, his father being an Irishman, and his mother a French woman. He studied his profession under Félix Duban, but his active mind was not content with the enforced leisure of a young architect's early years of practice, and he soon became distinguished as a writer, both on professional and social topics. His success in this field encouraged him to establish the well-known *Revue d'Architecture et des Travaux Publics*, and to this, with various technical books, he devoted most of his time, although he designed and carried out a considerable number of important buildings, and held the appointment of architect to the Government. Later, the weekly journal, known as *La Semaine des Constructeurs*, was established in connection with the monthly *Revue*, and has been lately carried on, under his general direction, by his son Marcel. We need hardly remind our professional readers of the merit of these admirable publications, but a little reflection may be necessary to judge of the learning, as well as the energy, discretion and fertility of resource, which were required to secure and maintain for them the reputation which they have for so many years held. Besides these, however, the profession owes to César Daly a great number of the most valuable architectural books ever published. His "*Architecture Privée*" was, in its time, constantly consulted by many American architects, and is still the best guide that we know to the art of planning, in which the French architects are unrivalled; while the "*Architecture Funéraire*," though less known, is in its way, not less valuable. His "*Motifs Historiques d'Architecture et de Sculpture d'Ornement*," perhaps, represents more labor and knowledge than any of his other works, but the host of cheap collections of a similar character that have since been published have, in this country, rather obscured its value. It is needless to say that the author of these splendidly illustrated books was a draughtsman of the first order, and Daly was not only this, but a very brilliant and graceful sketcher, and a master of perspective, which French architects, as a rule, know little about, while his graceful writing lent a charm to his works that learning and taste alone might not have given them. Personally, César Daly was the embodiment of energy and affectionate enthusiasm. Everything that affected architects was a matter of deepest interest to him, and, even under the weight of eighty-two years of active life, he was still ready to help wherever he could be useful to the profession. He leaves a widow, and three sons, the eldest of whom, the accomplished Marcel Daly, has long been associated with his father in the management of his various periodicals, and will, it may be hoped, continue the work which the profession could so ill afford to have interrupted.

THE visitors to the recent League Exhibition in New York will have noticed a curious piece of work, which was rather imperfectly shown in one of the front rooms. This curiosity deserves to be explained to those who have not seen it, as it certainly offers some valuable suggestions. Briefly, it consists, so to speak, of a stained-glass window, or, perhaps we should say, of a "transparency," made out of marble. Most people have seen the lamp-shades, which were once so fashionable, consisting of frames, filled with panels of unglazed porcelain, modelled in relief, in such a way that the light of the lamps shining through them, gave the effect of a monochrome picture. In the present case, a thick slab of rather translucent marble, from Vermont, is cut and drilled, in a similar way, so as to present, by transmitted light, an image of a nymph, standing by a pool of water, in which her figure is reflected. The work is said to have been executed by means of an atmospheric drill, something like the machines with which dentists excavate the interior of their patients' teeth; and the effect is certainly pleasing. It is already common to use translucent variegated marbles, such as Mexican onyx, for windows, and the step to regulating the variegations, by cutting, so as to present a pretty design, is not a long one to take.

A DISCUSSION is going on in Boston, just now, which recalls the famous "baldachino" controversy in London, only that, while the baldachino dispute set a large part of the English Church by the ears, and resulted in the severe punishment of an injudicious ecclesiastic, the Boston affair has, as yet, resulted in nothing worse than the airing in the newspapers of some rather singular ideas about church furniture. Every architect knows the plan of Trinity Church, in Boston, the most noted work of the late Mr. Richardson, and will remember that the arrangement of the chancel was originally as eccentric as the other portions of the design, the altar, or rather communion-table, being really a table, set in the middle of the chancel floor, encircled by the rail, which left a wide passage-way all around, between the rail and the wall. The object of this disposition was said to be to accommodate a large number of communicants, and provide for expeditious service from the central altar. It must be confessed that, to the architectural visitor, the arrangement savored of more of the railroad restaurant, or the picnic tent, than of the sanctuary; and notwithstanding the richness of the decoration, the building has never had quite the look of being devoted to a sacred purpose that most of us like to see in a church. To the professional observer, it was evident enough that this effect, or rather, want of effect, was mainly due to the absence of a conspicuous central object, which should first draw the attention, and then, by its realistic or symbolical powers, suggest the religious purpose of the structure of which it formed the principal feature. Quite recently, an amiable lady, whether at the suggestion of an architect, or led by her own perception, we cannot say, offered to pay for, and present to the church, a suitable reredos, to be placed behind and above the altar, for the purpose of giving the latter the prominence which it now certainly lacks. If she had called this ornament a mantel-piece, or a carved panel, there would probably have been no opposition to her plan; but there are a great many people in Boston to whom the name of a reredos, like that of a baldachino in London, immediately suggests incense and images, to say nothing of Pope Joan and the Spanish Inquisition, and protests against the introduction of such an object into Trinity Church began to pour in from all quarters, addressed to the newspapers, as well as to the rector and wardens of the church, and expressing various opinions, with an emphasis proportioned, as a rule, inversely to the qualifications of the writer for giving one of any value. As the intending benefactor of the church is a kind and modest lady, instead of an obstinate young clergyman, it is probable that the idea of presenting the reredos will be abandoned, for

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fear of causing real unhappiness in the church, but there is no doubt that the building needs, æsthetically, something of the sort, and it might be an interesting task for some of the Boston architects to try to devise some mode of raising the importance of the altar, without distressing the feelings of the Low Church members of the congregation.

THE largest statue ever modelled is said to be waiting pathetically on a wharf in Brooklyn, until some one shall pay the freight bill for transporting it from Rome, and so purchase its release. The statue is the work of Mr. John Donoghue, now of Rome, but once of Boston. It is moulded in plaster, and was intended for the Chicago Fair. According to the story told by the New York papers, the United States Government sent a ship to Europe, to collect and transport to this country works of art by American artists, destined for the Chicago Exhibition. Mr. Donoghue had engaged room on this ship for his statue, which would have been ready by the day fixed for the departure of the vessel, but, for some reason, orders were sent to have the ship start four weeks before the time originally set, and, as the statue could not be got ready so much earlier, it was left behind. Mr. Donoghue shipped it, when it was ready, by a steamer of one of the regular lines, and, on its arrival in New York, the bill for the freight, amounting to two thousand dollars, was sent to the World's Fair Commissioners. These declined to pay it, saying that they had no authority to do so, and, as the steamship company would not allow it to be removed until the bill was paid, it has remained on the wharf ever since.

MR. PENROSE has recently contributed to the Transactions of the Royal Society a paper on the orientation of certain Greek temples, which has an extraordinary interest. There has long been a tradition that the Egyptian temples and pyramids were set out with relation to certain stars, and it is said in the school geographies, we do not know with how much truth, that the North Star is always visible from the entrance passageway of the Great Pyramid. How this may be, we cannot say, but a hieroglyphic inscription has been found, dating from about 1445 B. C., in which it is distinctly said that "the corners of the temple of the mistress of Denderah" were established by stretching a rope, sighting at a certain star in the constellation of the Bull; so that the tradition, that this was the ordinary practice in setting-out such buildings, appears to be fully justified. Whether the Greek temples, built a thousand years later, were planned in any such way, would, naturally, be quite uncertain, notwithstanding the derivation of many of the Greek architectural fashions from Egypt; but there is internal evidence that they were, and, by the light of the supposition, the variations in plan among them assist in a curious way in elucidating their history. Mr. Penrose, who is something of an astronomer, calculated the positions of the principal stars during the Greek classical period, and, applying the necessary correction to their present position, examined the orientation of the principal temples on the Acropolis with reference to them. He found that the axes of the two ancient temples of Athena, on the Acropolis, the so-called archaic temple, and the one which occupied the place of the present Parthenon, were directed, as shown by the plan of their substructure, which still remains, toward the group of the Pleiades, at its setting. It is known that the Pleiades were connected in some way with the worship of Athena, and the orientation could hardly have been the work of chance. Moreover, the axes of the two temples converge slightly, indicating that the constellation was not seen in exactly the same direction from both. Owing to the movement of the solar system through space, the direction of any fixed star slowly changes, and the fact of the want of exact parallelism in the orientation of the two structures confirms the idea that both were directed toward the Pleiades, since the foundation of the archaic temple is laid out from an axis directed toward what was the position of the Pleiades about 1500 B. C., while that of the later temple, the date of which is approximately known, agrees with the position of the constellation at the time of its erection. It is evident that these differences promise to establish, with a considerable degree of accuracy, the dates of some of the older Greek buildings, concerning which no other information is attainable, and two temples at Rhamnus, of different dates, but both dedicated to the same divinity, are laid out with axes not quite parallel but directed toward the position, at different periods, of the bright star Spica. In some cases, the orientation appears to be such that, on a particular festival day, the rising sun will shine directly into the temple door; but there seems to be reason to believe that most, if not all, the Greek temples were planned, as to position, with reference to some heavenly body. This supposition, as the *Builder* sensibly observes, accounts much more satisfactorily for the varying orientation of the temples on the Acropolis at Athens than the old theory, that the Greeks faced their buildings in different directions for the sake of picturesqueness. Nothing else in Greek work shows any tendency to seek picturesqueness by violent irregularity, and it is much more likely that the Greeks sacrificed their natural love of symmetry to religious considerations than that they should have placed their buildings at all sorts of angles with each other for the sake of variety in light and shade.

THE Berlin Society of Architects has called a convention of architects, artists, clergymen and others interested in the improvement of the design and arrangement of Lutheran Protestant churches, to meet in Berlin at Easter. Whether the invitation is really to include all Protestants, as well as the Lutherans, we do not know, but presume that representatives of other denominations would at least be welcome. In any case, the convention is likely to be an animated and interesting one. While there is hardly, in Germany, anything like our High Church and Low Church division of parties in the matter of ritual, little liberty being allowed there in such things by the Government supervisors of the State Church, there are two strong parties in ecclesiastical architecture, one looking to the mediæval church-buildings as the proper models to be followed, while the other rejects mediæval architecture and mediæval theology together. A majority of the architects and artists of the convention would probably incline toward the mediæval notions of church architecture, but the Lutheran ministers, who are highly-educated and able men, and, from their similarity of training, would naturally think and act together, are not likely to accede to any æsthetic notions which do not commend themselves to their clear and positive minds; so that if the convention succeeds in agreeing upon any important innovation upon the present practice of Protestant church-planning, such innovation is likely to provide the starting-point for an interesting development of the art.

FOR ourselves, we think that there is ample room for the introduction of novelties in church architecture, which would commend themselves to artists and ecclesiastics alike. To say that a church cannot be artistic and, as Mr. Fugusson would say, phonetic also, without being mediæval or Romish, is pure nonsense. No doubt, a conscientious Lutheran minister would be sorry to see a statue of the Virgin set up in his church, and strings of little silver hearts hung around it; but it does not follow, because ignorant and sensual people like better to atone for their peccadilloes by making a ten-cent votive offering to their favorite fetish than to consult and obey their consciences, that persons who try to act from their knowledge of right and wrong, rather than from their impulses, may not derive support and comfort, in their spiritual struggles, from the glimpses of heavenly peace that art can reveal to them; and, impolite as it would seem to suggest the existence of evil in a fashionable church, we imagine that some of us, who remember the youthful days which we spent over the illustrated "*Pilgrim's Progress*," would be ready to believe that a clever painter, or sculptor, or glass-stainer, might make upon the minds of the younger frequenters of the church which he was called upon to adorn, an impression, not of the sharpness of Apollyon's claws, but of the misery of selfishness and sin, which no amount of intellectural casuistry could afterwards obscure. We all know that the churches of the Middle Ages were the books of the people who went into them. There, in the sculptures and paintings and stained-glass windows, they learned not only the lives of the saints, but the story of creation, redemption and judgment, and, with this, so much of natural science as could be taught in this way. Our modern science could no longer be taught by pictures and sculptures, but art has not yet lost its power of appealing to the soul, and our churches might be made, much more than they are, the books of the spirit.

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OFFICE-HELP FOR ARCHITECTS.[1]—XXIV.

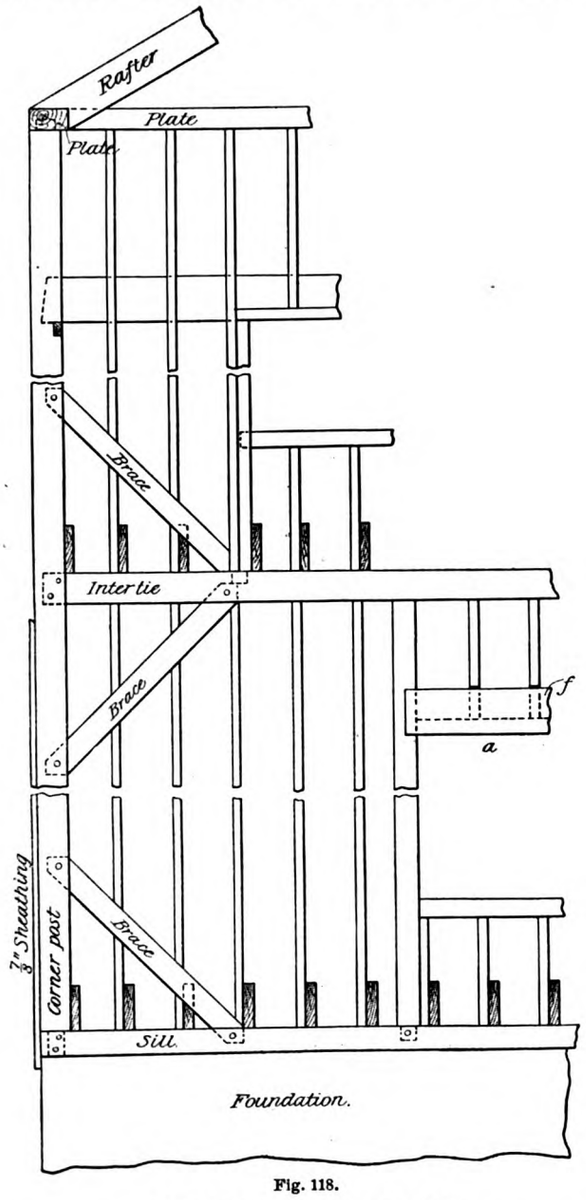


Fig. 118.

SECTION II.—FRAME WALLS:

§ 314. Material:—Spruce, hemlock, white-pine, yellow-pine, Oregon pine, oak, etc., are all used in different localities. Around New York, white hemlock or spruce is preferred.

§ 315. Regular Framing:—This is the old-fashioned method and consists of a heavy frame, mortised, tenoned and pinned together, with lighter intermediate framing (Fig. 118). For all classes of open framing, pavilions, some classes of gymnasium work and the like, it gives very satisfactory results, but is more expensive for ordinary framing than balloon-framing and presents no compensating advantages. For mill or slow-burning construction it gives by far the best results.

[1] By George Hill, Consulting Engineer. Continued from No. 943, page 29.

ABBREVIATIONS AND SYMBOLS.

= equal to.	∴ therefore.
∥ parallel to.	□′ square feet.
÷ divided by.	□″ square inches.
× multiplied by.	8* read 8 pounds per lineal foot.
+ added to.	⊏ channel bar.
a^2 a multiplied by itself.	⌶ I-beam.
$a > b$: — a greater than b.	⊤ T-iron.
$a < b$: — a less than b.	∟ angle iron.
$\frac{a}{b}$: — a divided by b.	⊥ deck beam.
	● round section.

I ton = 2,000 pounds as this is the conventional ton, the legal ton is 2,240 pounds, but is rarely used.
l = the length between supports of any beam or girder or height of any column, always in feet.
b = breadth of any beam or girder, always in inches.
d = depth of any beam or girder, or the least transverse dimension of any column, always in inches.
L = total load uniformly distributed coming on any piece in pounds.
L^p = " " " " " per square foot in pounds.
W = concentrated load on any piece in pounds.
s = span of any arch or truss between centres of end pins in feet, or spread of footing courses.
A = area of any section in square inches.
M = maximum bending-moment in inch pounds.

TABLE XXXVI.

SIZES OF PARTS FOR VARIOUS STRUCTURES FOR REGULAR FRAMING.

Parts.	Area of houses.		Slow-burning.
	1,200□′	Larger.	
Angle posts.....	4″ × 8″ / 4″ × 6″	6″ × 8″ / 2″ × 6″	10″ × 10″
Sill.....	4″ × 10″	4″ × 10″	6″ × 10″
Plate.....	6″ × 8″	6″ × 10″	6″ × 10″
Interties.....	4″ × 8″	6″ × 8″	8″ × 10″
Studs at openings.....	4″ × 6″	6″ × 6″	4″ × 6″
Braces.....	4″ × 6″	6″ × 6″	6″ × 8″
Intermediate studs...	2″ × 4″	2″ × 6″	4″ × 4″

For slow-burning construction, the sizes will be about as in the third column. The bents should be spaced about 12′ 0″,

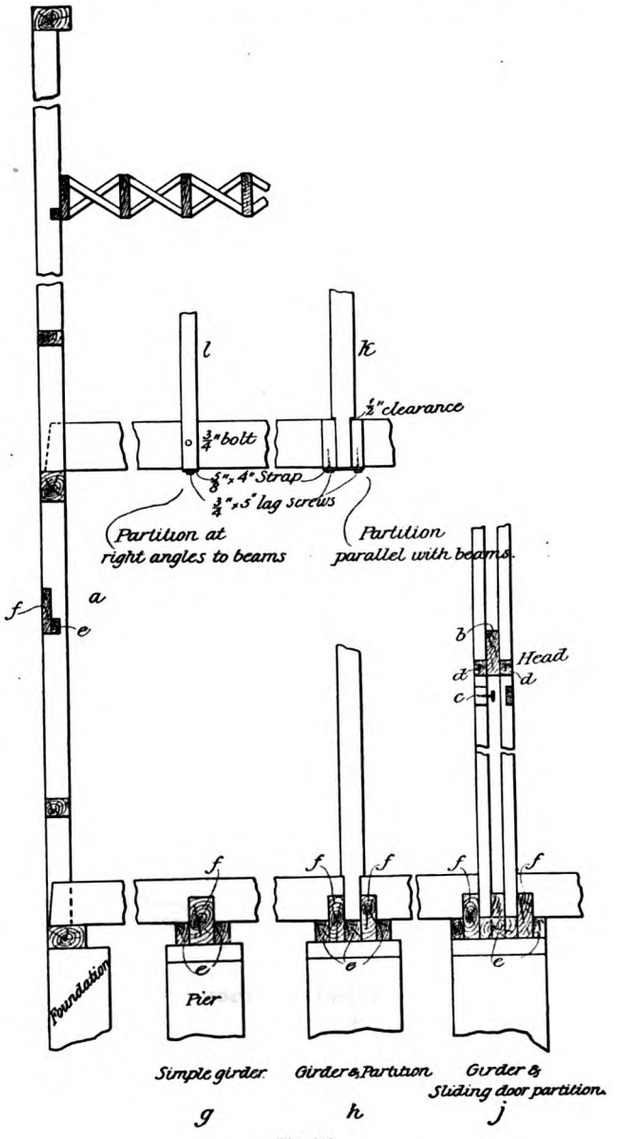


Fig. 119.

c to c; interior posts 12″ × 12″ to 10″ × 10″ depending on the load; side posts 6″ × 10″ to 6″ × 12″ and beams spaced about 4′ 0″, c to c.

Bracing:—This is accomplished by means of braces of 4″ × 4″ to 6″ × 6″ tenoned and pinned into the angle posts and sills. Bracing is further effected by using the Byrkit-Hall

n = distance of centre of gravity of section from either top or bottom edge in inches.
I = moment of inertia, neutral axis through centre of gravity.
R = moment of resistance of section.
r = radius of gyration, in inches.
Sc = safe compressive strain in pounds per square inch.
St = " tensile " " " " " "
Ss = " shearing " " " " " "
S = strain per square inch in extreme fibre.
P_e = upward reaction of support at left-hand end of beam.
P_f = " " " " " right " " " "
e = distance of centre of gravity of load from left hand of beam.
f = " " " " " " " " right " " "

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patent sheathing-lath put on diagonally, nailed to every bearing and the openings sawed out after the nailing is done. After the building is enclosed, the sheathing-lath should be plastered one heavy coat of scratch-coat mortar, or the outside can be sheathed with $\frac{7}{8}''$ tongued-and-grooved stuff, put on diagonally and covered with sheathing-felt, affording an excellent protection against the cold.

The treenails or pins should be so laid out as to bring all parts to a firm bearing without splitting anything. All openings should be bridged over as shown, by using a section of a floor-beam or by making a girder similar to Figure 46 *a* and *b* of strips spiked to the studding.

Laying-out: — This should be done so that there will be the same amount of shrinkable material between the masonry and the plate all around. This can be secured by following the detail of Figure 119. In planning, sections should be made of every wall throughout the building showing the method of framing to be used throughout, and the carpenter should be held to it rigidly. This will save many alarming cracks in the plaster, which it would otherwise be necessary to cut out and repair. All framing in regular frames should be in bents one floor at a time.

Partitions: — These should be treated in manner similar to the outside walls, interties, etc., being as carefully laid out and the shrinkage as carefully planned for, or following the general lines of Figure 119, *g*, *h*, *j*, *k*, *l*. These are framed as follows:

In *g* the girder *f* has two pieces *e*, *e*, bolted to its side on which the floor-beams frame; the height of *e* being the same as the height of the sill. In *h*, in which the girder carries not only the floor-beams but the partition, it is made of two parts with three strips, the central one being made 4″ broad, the outer ones 3″ broad, and all of them bolted through to the girder-members *f*. The height of *e* being the same as the height of the sill, the shrinkage is the same. The studding, which comes down and rests on the central piece, should be gained out so as not to rest in any way on the floor or the girders. In *j* the girder carries a sliding-door partition, and can be made with a wide centre or, in the event of considerable weight, the space between the studs can be filled with another girder-member as indicated by the dotted line so as to give still greater strength. The top of this partition would have a member *b* carrying two strips well bolted to the side of it, which strips would be gained into the studs at either side of the opening, and would serve to carry the partition studding coming from above. Underneath it, to carry the door, there would be placed a strip to which the door-track would be secured. This would come at the height of the top of the door-frame. In section *l*, the partition is indicated starting on an upper floor and running at right angles to the line of beams. The partition studs should be brought close beside each beam and bolted to the beam with a $\frac{3}{4}''$ bolt, and their bottom should rest on a $\frac{5}{8}'' \times 4''$ strap, secured to the floor-beams by means of a $\frac{3}{4}'' \times 5''$ lag-screw. In *k* the partition is shown starting on an upper floor, running parallel with the beams. Here two beams would be brought side by side and each stud would go between them, being supported on a $\frac{5}{8}'' \times 4''$ strap secured to the beams with $\frac{3}{4}'' \times 5''$ lag-screws at each end. The partition would be carried on two or more beams secured together forming a girder. All openings should be bridged with floor-beams spiked to the studding at the ends or gained to them with the ends of the beams provided with a firm bearing. The sizes of the principal partitions should be carefully computed as they often carry more weight than the outside walls. Sliding-door partitions should be so framed that the studdings that carry the beams above run through continuously. The opening should be spanned as before described. Partitions should be framed in bents resting on caps or sole-pieces, only when the side walls are also so framed, thus keeping the framing of the same kind. Do not permit a partition to be framed on the top of a sole-piece spiked to the top of the floor-beams. Never attempt to make a truss of the rough framing; make a girder of strips placed close together and nailed to every stud as shown in Figure 46 *a* and *b*. If the load that the partition carries is too great for a girder of four floor-beams, the cheapest and best means of carrying it is by means of a steel beam. All sliding-door pockets should be lined with tongued-and-grooved stuff so as to be approximately draught-proof.

§ 316. Balloon-Framing: — This is now the usual method and consists of relatively light pieces in sufficient number and of sufficient depth to secure the necessary stiffness and strength. The studs carry through as far as possible, and the floor-beams frame onto a $1'' \times 4''$ or $1\frac{1}{2}'' \times 4''$ ribbon or girt gained 1″ into the studs. (Fig. 120.) Slow-burning is secured by

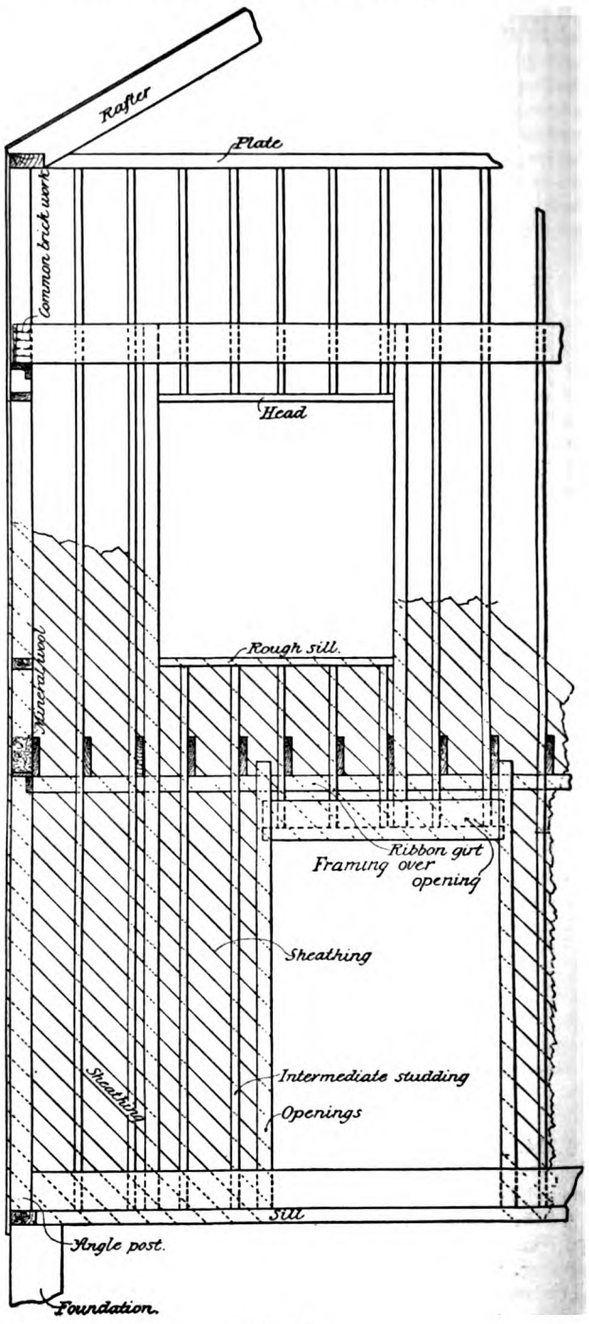


Fig. 120.

using the Byrkit-Hall sheathing, back-plastering on it and filling the space between all floor-beams at each story the full depth of the beams and the full width of the studs with mineral-wool or common brickwork in lime-mortar, thus preventing the rapid spread of fire through the voids of the frame.

Sizes for good practice are as in Table XXXVII.

TABLE XXXVII.

SIZES OF PIECES FOR BALLOON-FRAMING.

Parts.	Size of house in square feet, (3) stories high.	
	1,200□′ or less.	More than 1,200□′.
Angle posts.....	$\left\{\begin{matrix}4'' \times 6'' \\ 2'' \times 4''\end{matrix}\right.$	$\left\{\begin{matrix}6'' \times 8'' \\ 2'' \times 6''\end{matrix}\right.$
Sill.....	$4'' \times 6''$	$4'' \times 8''$
Plate	$3'' \times 8''$	$4'' \times 10''$
Ribbons.....	$1'' \times 4''$	$2'' \times 4''$
Studs at openings..	$3'' \times 4''$	$4'' \times 6''$
All other studs....	$2'' \times 4''$	$2'' \times 6''$

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Bracing: — The sheathing is entirely depended on for the bracing; the sills are usually laid down in a bed of fresh mortar and well settled, then studs are put up all around, 16″ on centres, and of the full height from sill to cap, but not cut to length. Then the ribbons are cut in and spiked and the plate put on, the side being held in place by means of stays spiked to the studs and to the floor-beams. The floor-beams are sized to the sills as soon as they are laid and before the studding is placed.

As soon as the two bearing-walls are up, the floor-beams of the second tier are put in place, and then the side walls are placed and the beams spiked to the studs; then additional studs are put in, framing out the openings, rising from sill to girt above the opening. Then all sides of the building are sheathed with the sheathing decided on, nailed with at least two nails to every bearing. The openings are sawed out, of just the proper size to admit the frames, and studs are cut in, framing out the top and bottom, and the sheathing nailed to them. The sheathing should always be put on diagonally, and should run in different directions on different sides of the house. A building so braced and with the under floor laid diagonally is practically indestructible by anything but fire, and will burn slowly if the precautions above noted are taken.

Laying-out: — See the same heading in § 315 and Figures 119 and 120. In balloon-framing when floor-beams run end-on to studs they should be brought close to the studs and well spiked to them. When the beams run parallel to the studs, the first and last beam of the tier should be against the studding and well spiked to it. Lay-outs for the framing should be made the same as for regular framing, showing the framing of every partition and wall throughout the house.

Partitions: — These should be framed the same as with the outside walls, the same precautions being taken as described under this heading in § 315. It is especially necessary that the studs of all partitions lining up through two or more stories should be made continuous and the framing be done with a ribbon strip. Hot-air flues should be provided for in the spacing of the studding, as the usual 16″ centre spacing does not give a sufficient size to the flue to heat a large room. The details of supporting girders, door-openings, sliding-doors, etc., should be the same as in Figure 119.

Bridging: — All studding not carried down to a solid bearing should be bridged by having a 2″ × 4″ piece cut in 1″ on each side of the partition, making an *A* truss, be carried by means of a steel beam, or supported between beams.

§ 317. Slow-Burning: — Slow-burning or mill construction is similar to regular framing except that unpainted, mill-dressed timber should be used. End of girders in walls should be carried on columns, same as interior ends. All columns should be made with 1″ allowed for loss of strength by charring and a 1½″ hole should be bored down the centre of the columns with ½″ transverse holes at each end, affording ventilation to the interior. Ends of all bearing-pieces should be exactly square, and when setting into metal sockets should have the edges slightly chamfered, setting into a lip on the socket. The sockets should be so arranged as to drain themselves of all water falling into them. When columns rest on the side of a sill, the joint should be made with a piece of tin interposed to distribute the strain and to prevent cutting. Increase the dimensions of all pieces 1″ so as to provide for charring in case of fire. Use plenty of iron ties around all columns to hold the girders together. (Fig. 121.) Put in 4″ × 6″ stuff, framing out openings and for intermediate studding in panels, about 3′ 0″ on centres.

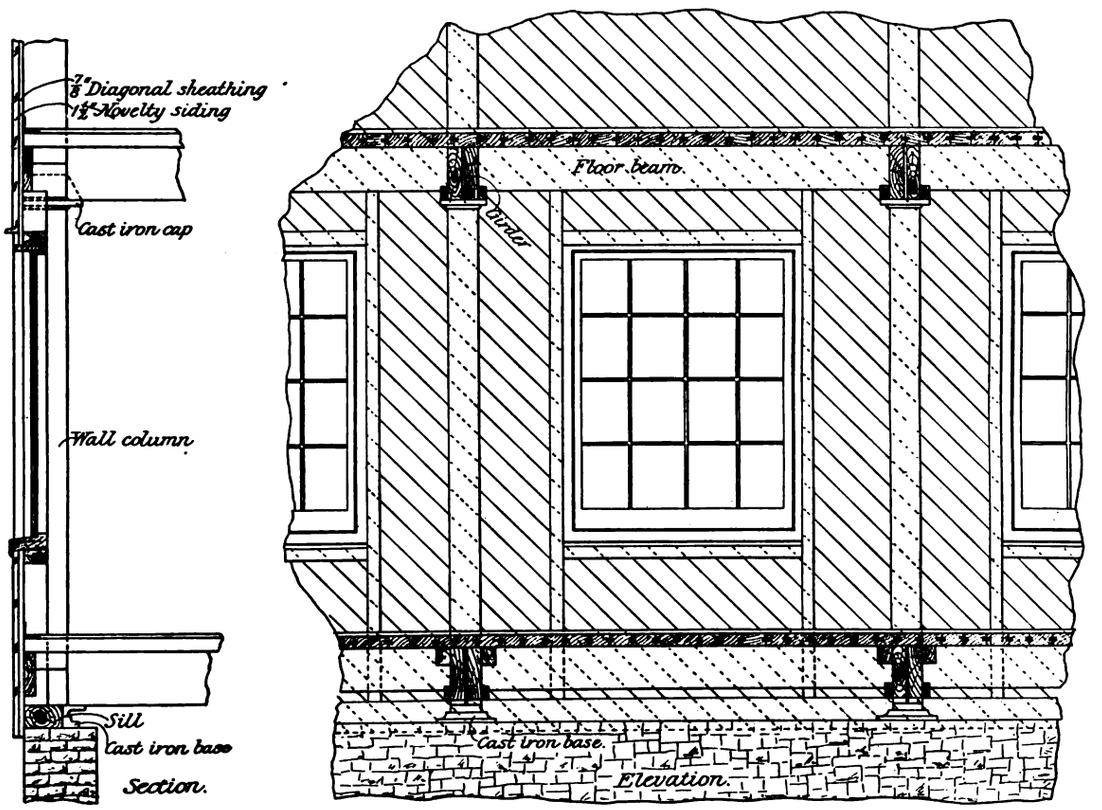


Fig. 121.

§ 318. Strength: — The sizes as given are sufficient for all ordinary work, but for warehouses, public halls, isolated columns and the like, the strength should be computed as per § 172.

Stiffness: — This is as important as strength and will usually be secured when the columns are properly proportioned, and when walls are properly braced.

(To be continued.)

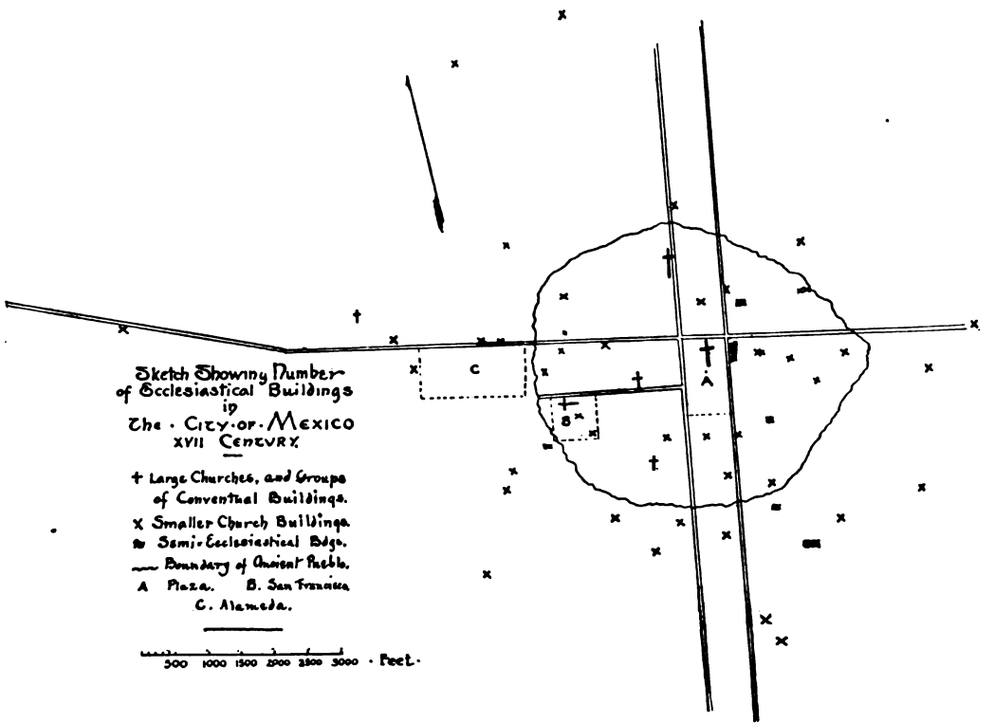
TO MOUNT PHOTOGRAPHS WITHOUT BUCKLING. — The satisfactory mounting of photographs is a troublesome operation, and the following suggestion from a contributor to the *Outlook* may be of assistance to amateurs: I have found a method by which a photograph or engraving can be mounted on the thinnest paper without curling or wrinkling. If the picture is a photograph it should be ironed out smooth with a hot iron and then trimmed. Mix a little gum-arabic in hot water, so as to make a rather thick mucilage. Place the picture on the page in position and mark the page just inside the corners. Remove the picture and take some of the mucilage on a ruling-pen and draw a heavy line of mucilage from one point to another, so as to make a line of mucilage all around the place where the picture is to be. As soon as the mucilage is sticky, put the picture in place, and a book over it to keep it flat. When dry, you will have a smooth mount that will not curl.

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TOPOGRAPHICAL AND ARCHITECTURAL HISTORY OF THE CITY OF MEXICO.[1]—IV.

THE CITY IN THE SEVENTEENTH CENTURY.

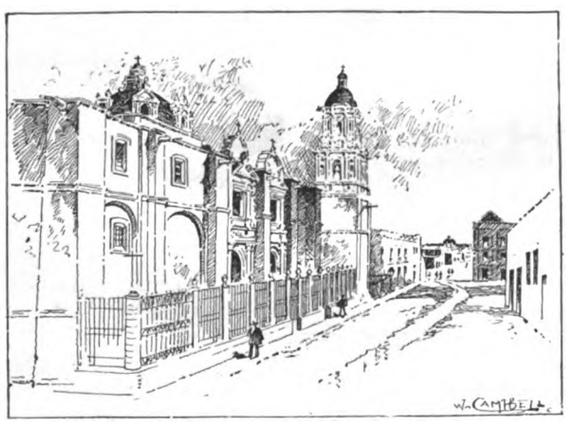
THE changes in the City of Mexico witnessed by the seventeenth century consisted not only in its expansion and the addition of many new buildings, but also in the gradual disappearance of some of the earlier structures, and, as it were, a second growth upon their trunks. This occurred to fourteen church buildings of the previous century. Four churches begun in the former century were completed in this. The Cathedral was so far completed in 1656 that a provisional dedication was held. Its final dedication was postponed until ten years later, and the towers were not completed for another century and a quarter. The amount expended, up to the year 1656, upon this edifice, was $1,752,000. Other large sums were expended upon church buildings in Mexico during this century, indicative of the wealth of the city and the grandeur of its architectural enterprises. Upon the choir alone of the San Agustin church and monastery (rebuilt after its destruction by fire in 1676), $240,000 were expended. Private wealth was lavished upon church-building. Don Tomas Suaznaba, and Don Simon de Haro and his wife contributed $250,000 towards the rebuilding of the Convent of Nuestra Señora de la Concepcion. Don Alvaro Lorenzana gave $100,000 towards the completion of the present Church of N. S. de la Encarnacion built in 1648. A private purse bore the expense of rebuilding the Church of San José, a building still standing. It was from a bequest of the wife of Don Simon de Haro (who also bequeathed her house and $10,000 to the church and monastery of the Capuchins) that the present Church of Santa Catarina was built. From a bequest of Doña Beatriz de Miranda the Church and Convent of Jesus de la Penitencia were rebuilt. Captain Don Domingo de Cantabrana bestowed $70,000 upon the church and monastery of San Cosme. It was out of private means that the church and monastery of Belen de los Padres were rebuilt. The administrators of the estate of Cortés appropriated $43,000 towards the completion of the Church of N. S. de la Purisima Concepcion at Huitzillan. Don Cristobal Zuleta added a beautiful chapel to the gradually expanding group of buildings of the Franciscans, to which were also added within the century the Chapel of San Antonio and the most important member of the group, the Chapel of N. S. de Aranazu. At enormous cost the Marquesa de la Cadena built the Convent of Santa Inez for the Concepcionistas. The existing Church of Santa Teresa la Antigua was built at the cost of Don Esteban Motina de Moquera. Upon the Church of N. S. de la Merced $150,000 were expended. Don Manuel Gomez built the Church of the Betlemitas, and Don José Retes Larzuche built San Bernardo Church and Convent. Thus, largely by private means old ecclesiastical edifices were rebuilt and new ones to the number of seventeen erected. The City of Mexico was rapidly assuming the appearance of a vast ecclesiastical establishment. To these may be added the erection of a Theological Seminary and several colleges. And such a marked reform was effected in the hospital system that for the first time in the history of the city each patient was provided with a bed for his sole occupancy in the Hospital de los Desamparados. Of these ecclesiastical buildings a large number remain to-day, changed only by the hand of time, and by circumstances pertaining to the present century, to which reference will hereafter be made.



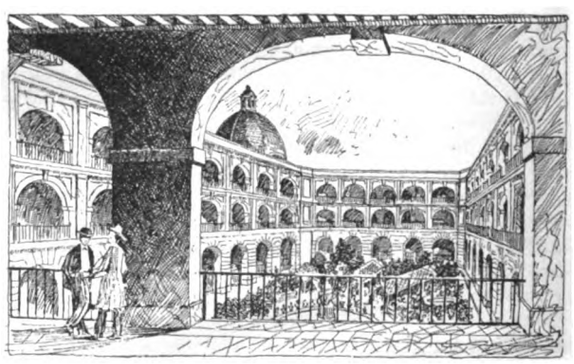
Meanwhile a long succession of Viceroys and various municipal officers were devoting attention to works of public importance in the capital of New Spain. The water-supply was the first subject to receive attention. Under the supervision of Juan de Mendoza, the tenth viceroy, the longer of the two aqueducts which now supply the city with water was constructed from beyond Tres Cruces, four miles from the city, skirting Chapultepec, entering the present city at Tlaxpana, following the Tlacopan causeway and ending abruptly at San Cosme. It comprises more than 900 arches of brick and stone, set upon a solid foundation and carrying a solid stone wall five feet thick with an open channel on top. Its present condition speaks well for the honesty of the masonry of the seventeenth century. Its cost, given as $150,000, indicates the cheapness of labor and materials in those days and also hints at the architectural results possible of attainment by means of the sums mentioned as bestowed upon ecclesiastical edifices. The system of *repartimientos* had been seriously impaired through the agitation of reformers, but there yet seems to have been slaves enough to perform the gigantic works undertaken in this century. In the viceregal administration of Diego Fernandez de Córdoba (1613–1621), this aqueduct was extended along the causeway to the Convent of Santa Isabel at



Church of San Jose de Gracia, still standing, Seventeenth Century.



Convent of La Concepcion, City of Mexico, Seventeenth Century.



Principal Patio of the Convent of La Incarnacion, City of Mexico, Seventeenth Century.

[1] Continued from No. 936, page 112.

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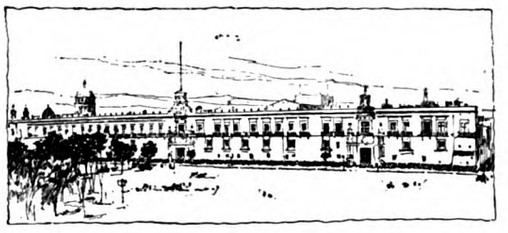
an additional cost of about $100,000. The extension has since been removed, leaving the aqueduct as at first built.

The cleansing of the *acequias* and the paving of some of the streets are set down as work done in 1605, under the progressive viceroy



San Cosme, City of Mexico, Seventeenth Century.

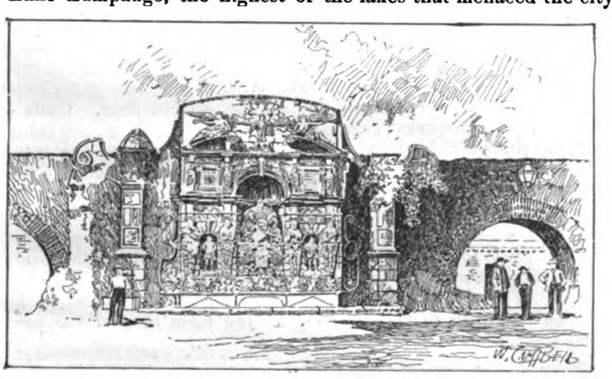
Mendoza. An inundation in the previous year had damaged much property, and especially the *calzadas*. Under the direction of a Franciscan friar, the causeway leading to Tepeyecac (now Guadalupe) was repaired and enlarged. In the repairing and enlargement of the Acachinanco causeway the branch formerly running to Coyoacan seems to have disappeared. New causeways to Chapultepec and Piedad were constructed. Later in the century (1675–6) under the viceroy Rivero, who was also Archbishop of Mexico, the Calzada Nueva was constructed nearly parallel with the northern causeway to Tepeyecac. It was intended for the accommodation of religious pilgrimages to Guadalupe, that place having by that time become an important religious point by reason of an alleged apparition of the Blessed Virgin Mary. Calzada Nueva was adorned with a large *glorieta* near the middle and throughout its length with fifteen beautiful shrines or altars dedicated to the mysteries of the Rosary.



Sta. Teresa Antiqua and the National Palace, City of Mexico, Seventeenth Century.

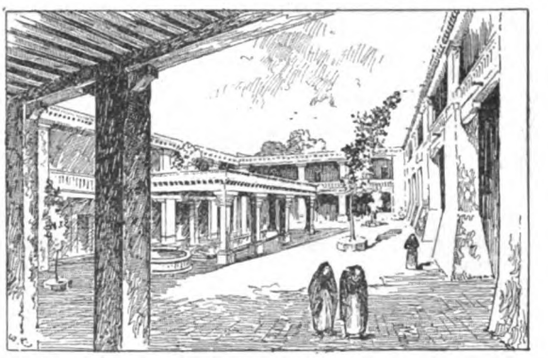
These were twenty feet in height and richly sculptured. Since the middle of the present century a railroad company has found it convenient to use this magnificent causeway as its road-bed between Guadalupe and the capital.

The inundation of 1604 precipitated plans for protecting the city from such perils. Enrico Martinez submitted a proposition to make a tunnel at such a level as to drain Lake Texcoco and carry off all the waters precipitated upon the Valley of Mexico. Such in general is the scheme now being carried out. It was abandoned in the seventeenth century because of its great cost. In November, 1607, Martinez began the execution of a plan scarcely less daring, and in eleven months from that time he had constructed a tunnel eleven feet wide and thirteen feet high from Huehuetoca to the river Tula, a distance of over four miles, for the purpose of carrying off the surplus water of Lake Zumpango, the highest of the lakes that menaced the city.



Fountain at Tlaxpana Gate and Aqueduct from Tres Cruces, Seventeenth Century.

The tunnel was soon found to be insecure, however. The inner facing was of adobe which soon softened and caved. A stone facing, having no firm foundation, was found to be equally insecure. The thirteenth viceroy, Diego de Córdoba, upon his arrival in Mexico, in 1613, took a deep interest in the schemes for protecting the capital from inundation. Upon his application the Spanish king sent Adrian Boot, an engineer from Holland, to inspect the work of Martinez. He reported the tunnel insufficient, and as



Patio of the Convent of Sta. Isabel, City of Mexico, Seventeenth Century.

might be expected from an engineer of the Low Countries, favored dikes. To catch the overflow from Lake Zumpango and prevent its being precipitated upon the city, dikes were accordingly built about Lake San Cristobal.

In 1629 the time came for testing the utility of tunnel and dikes. The rainy season that year set in with unusual violence. On the 29th of June, Martinez, either to prevent the destruction of his work or through pique at the popular criticism upon it, and at having the advice of an engineer from Holland preferred to his, closed the mouth of his tunnel. Soon Zumpango overflowed into San Cristobal, and that lake overflowed the dikes, and in a short time the streets of Mexico were three feet under water, and thus they remained for three years, Martinez spending the time in prison.

It would be impossible to picture the result of this inundation. Many edifices suffered total destruction. The population was decreased by the death of 3,000 Indians and the removal of nearly all the European families. Court and local legislative bodies suspended their sittings, churches were abandoned and mass was celebrated on the balconies and housetops. People moved from place to place in canoes. The city really became what it had been called before the conquest, "The American Venice." Its removal to the high ground between Tacuba and Tacubaya was discussed, the cost of the removal being estimated at $50,000,000. It has even been stated that a royal edict was procured, ordering the removal. But in 1632 the water subsided, and the royal edict (if any there were) was suppressed. In 1634 the fearful scenes of 1629–31 were repeated to some extent, but after the rainy season of that year earthquakes opened rents in the ground causing the rapid subsidence of the waters. Martinez was released from prison and commanded to employ such measures as would prevent any further inundation of the capital. He re-opened the tunnel, and so far made concession to his Holland rival as to rebuild the dikes about San Cristobal as they remain to-day, — two in number, two miles and three-quarters and a mile and a half in length, respectively, and eight or ten feet high by twenty-eight feet wide.

The prominence of ecclesiastics in the engineering works of this century is noteworthy. A Jesuit was consulted previous to the employment of Martinez, and after his death three Franciscans took charge of his work. Franciscans had charge of the reconstruction of the *calzadas*.

Directly under the eyes of the viceroys as they sat in the palace, was that which should have demanded earlier attention than it did, that is to say, the plaza. That it is reported to have remained above water during the great inundation of 1629–32 would indicate that the great teocalli had not been razed to the ground, but that the débris therefrom still made the main plaza several feet higher than



La Piedad, City of Mexico, Seventeenth Century.

the level of the city streets. Buildings were encroaching upon it. In 1611, by viceregal order the market was removed, but large numbers of sheds and shanties that had been built in the southern half of the square, were allowed to remain. It is a notable fact that

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Mexican trade with China was already established at this time, and Chinamen composed a part of the population of the capital of New Spain. In November, 1658, a fire began in a barber-shop belonging to a Chinaman in the plaza and spread to all the inflammable sheds in the vicinity. It was the great historic fire in a city which has

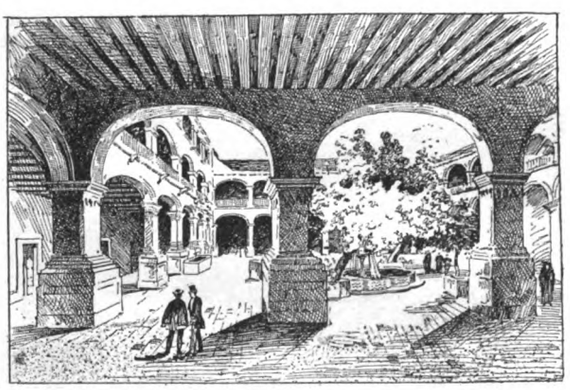


Convent of Sta. Clara, City of Mexico, Seventeenth Century.

long since solved the problem of slow-burning construction, if it has not actually produced fireproof buildings. To quench the flames resort was had, not to fire-engines or pumps and water, but to the sacred relics in the possession of the Church, and to a procession of the clergy headed by the archbishop. The fire cleared away the objectionable buildings, and a viceregal order relegated all fruit-sellers, pork-dealers and bakers to certain grounds south of the palace, — a marshy tract where, previous to the Conquest, the Aztecs had indulged their fondness for the game of *pelote* or *volador*. It had subsequently been used for an occasional bull-fight or an *auto de fé*. The chief market of the city was now established there. For nearly two centuries the city paid rent for the land to the heirs of Cortés to whose lot it had fallen in the first partition of the island.

The reform in the plaza was only temporary, however. The city was shortly afterwards collecting rent from two hundred and eighty *cajoncitos* (little shops) upon the plaza, and apparently well satisfied with their occupancy of that ground. So, forming the group of sheds known as the Cajoncitos de San José, they awaited destruction in another great historic event — the riot of 1692. This riot grew out of the famine of that year. A mob of Indians rushed to the plaza, sought the viceroy and the archbishop, assaulting the viceregal palace and Arzobispado with sticks and stones. Failing to gain an entrance by these means the insurgents built fires at the doors of the two palaces and of the Diputacion, using the *cajoncitos* for fuel. Damage to the buildings thus attacked amounted to $3,000,000. The cathedral clergy finally quieted the tumult by marching to the scene of the conflict with the Sacred Host borne aloft before them.

This second clearing of the plaza was as shortlived as the first, though the city authorities, in 1703, erected a handsome building on the south side of the plaza for the accommodation of the merchants of the better class. In the meantime the fruit-venders again took possession. Nor were they and their *cajoncitos* the only object to shock an æsthetic taste in the plaza of Mexico in the seventeenth or even in the eighteenth century. Directly in front of the viceregal palace stood the gallows and frame for displaying the heads of executed criminals. A statue of Ferdinand VI not far off was a work of no artistic merit. The cemetery of the Cathedral extended far



Patio of the Convent of Sta. Clara, City of Mexico, Seventeenth Century.

beyond the present garden and was surrounded by a high wall. The Cathedral was without its two towers. Altogether the plaza at the end of the seventeenth century presented a far less prepossessing appearance than the Zocalo of the present day.

The large and imposing building erected directly south of the plaza for the Palace of the Ayuntamiento (Diputacion) remained for nearly thirty years in the ruinous condition in which the mob had left it. But the work of rebuilding the viceregal palace was begun immediately and from the end of the seventeenth century the building at present known as the National Palace dates its existence. Not unlikely it preserves the general form of the building erected by Cortés in that locality. Arthur Howard Noll.

[To be continued.]



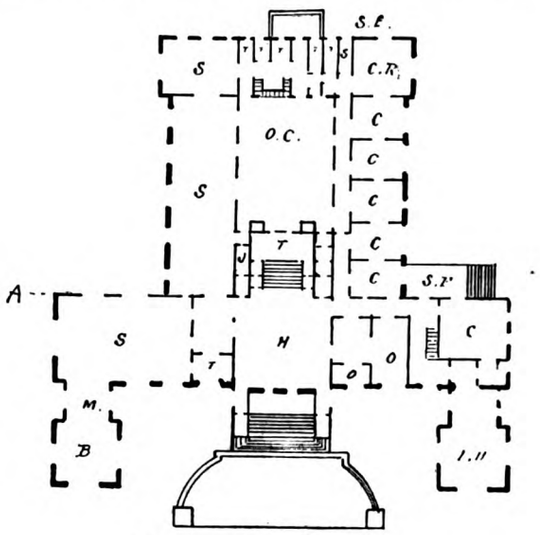
EXHIBIT OF COMPETITIVE PLANS FOR THE NEW CORCORAN GALLERY OF ART.

SOME years ago the Trustees of the Corcoran Art Gallery purchased a piece of ground on Seventeenth Street and New York Avenue. After the purchase they called in Mr. Ernest Flagg, architect, of New York, and for a year, more or less, he worked with the Trustees of the Gallery. At this stage of the proceedings it was determined to invite a limited number of Washington architects to make competitive drawings, paying them a small sum each. As might have been expected, Mr. Flagg, who was admitted to the competition and who had full knowledge of the desires of the committee and a long time to study the problem, was awarded the building.

At the last meeting of the Washington Chapter of the A. I. A. the drawings submitted in this competition by Messrs. Ernest Flagg, Hornblower & Marshall, Robert Stead, Bruce Gray and P. J. Pelz, were placed on exhibition in the Chapter-room.

The scheme was for a building to be erected in two sections. The first for present use, the second portion for future use.

Hornblower & Marshall and Bruce Gray in their scheme for immediate use ignore the shape of the lot, which is an acute angle formed by the intersection of New York Avenue and Seventeenth Street.



Hornblower & Marshall, Architects.

Their fronts run parallel to Seventeenth Street, and their side at right angles thereto. Mr. Gray arranging his in the form of a cross with a central stairway and dome above, with sculpture-galleries on the first floor and picture-galleries on the second floor. Halls on either side. The trustees', curator's and other office rooms are behind the steps, probably intended to be cleared away when the future rooms are built. The future addition is grouped around two interior courts of size ample to light the rooms on the lower floors. The design is an Italian Renaissance, the most prominent and effective features of which is the entrance. The centre is surmounted by a dome of good form, but which would probably cast disagreeable shadows when the light fell upon the skylights over the picture-galleries. The only design that suggests a commemoration of Mr. Corcoran is shown in this drawing, in the form of a statue prominently located on the entrance front.

Hornblower & Marshall make their addition for future use without any reference to the street lines, and on this rests one of its chief attractions. There are two prominent wings, the main building and entrance being placed more than fifty feet back from the building-line of the street. This gives an opportunity for green grass and broad effects and effective, generous steps. A square entrance-hall, leads to a broad, well-lighted flight of steps. On the left of which

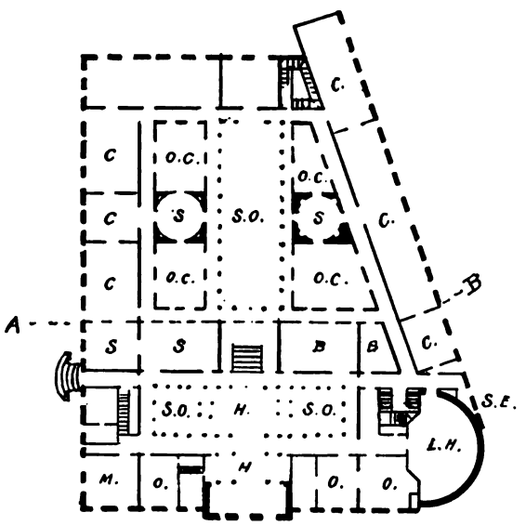
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and with a separate entrance are placed the class-rooms for the Corcoran School of Art, as well as rooms for the trustees and executive officers of the Gallery; on the right are the sculpture-galleries, so grouped that visitors would pass naturally and readily from room to room. It was suggested that the large interior court be roofed-in for heroic statuary.

The whole of the second story is arranged for picture-galleries. Visitors would naturally pass from one room to another around the large interior court. The staircase and entrance-hall are effectively arranged and the elevator, toilet-rooms, etc., grouped where one would naturally expect to find them.

The exterior of this scheme is simple and refined, conveying at a glance the suggestion that it was made for an art-gallery. All the suggestions as to details, ornamentation, mouldings and general treatment, indicate a refined and dignified building. The perspective-drawing is a very sketchy water-color, which hardly does the idea justice. There is a slight suggestion of color on the wall-surface back of the columns of the porch over the doorway. The grass-plot between wings, and the triangle on New York Avenue would add much to the pleasing effect in the completed structure.

Ernest Flagg's scheme covers the whole lot with the exception of a small portion on the west. You pass directly from the street into



Ernest Flagg, Architect.

In front of line A B for present use — back for future construction.

T. Toilet-room.
C. Class-room — Picture-galleries and Class-rooms above.
C. E. Class Entrance.
O. Offices — Picture-galleries above.
O. C. Open Court.
H. Entrance-hall.
S. Sculpture — Picture-galleries above.
S. O. Sculpture — Open to Roof.
M. Medals.
B. Bronzes.
J. Janitor.
L. H. Lecture-hall.

a large statuary-hall, divided into three squares by six rows of columns in its length and two in its breadth. These columns will interfere materially with any effective view of the sculpture *en masse* and must interfere seriously with the placing of pieces of sculpture so they can be viewed from different standpoints and to the best advantage. The smaller rooms are so arranged that you must always come back into the statuary-hall before passing into another room. The executive officers and janitor have no access to their rooms without passing through the statuary-hall, and all who wish to pass up the main stairway must go through this hall. In the portion of the building for future use is another large statuary-hall running at right angles to the one in the building for present use. This hall is two stories high, surrounded by a colonnade. This hall is the effective feature of the plan. On each side of it are open courts. The rest of this floor is taken up by class-rooms; the whole frontage on New York Avenue being used in this manner as well as the principal frontage on E Street. It is necessary for any one using the class-rooms in connection with the former rooms to pass through the large statuary-hall. I presume the committee and architect had some reason for this.

A peculiar feature of this plan is the apparent lack of reason for the open courts, as they seem to seriously complicate the plan in both stories without being of any real use. The statuary-hall enlarged would have formed a much better entrance to these rooms, would have lighted this portion better than the interior courts, and certainly would not have cost any more.

In the second story, the space over the small executive rooms, and class-rooms on the east (Seventeenth Street) and west is taken up by picture-galleries. The ones in the portion for present use are accessible from the corridor or colonnade over the statuary-hall, two being so detached that they would be probably missed by the general visitor without a plan to guide him. The open courts interfere seriously on this story with the simplicity of the plan, for any one on the corridor of the main statuary-hall would hardly think to find the principal picture-gallery by passing down a comparatively narrow passage, as if it were leading to some private apartments.

The plan would be materially simplified by at least leaving out the southern open court. Standing east of the stairway, quite an effective vista could be obtained if it were not for its destruction by the four cross-lines of columns. This extensive corridor around the statuary-hall for future use leads practically nowhere; where we might expect a series of interesting rooms, opening upon it, there is nothing.

There seem to be serious defects in the lighting of the lower floor which will doubtless be rectified in the working-drawings, although it will require a material alteration of the plans to accomplish this end.

When the portion for future use is added it leaves the rooms for antique casts and bronzes (S, S, B, B,) lighted only by what is borrowed across the hall from an interior court, some twelve or fourteen feet away: while the main entrance or statuary-hall will be but indifferently lighted by its two open wells, seventy-two or more feet apart, and the light that will come down the stairway.

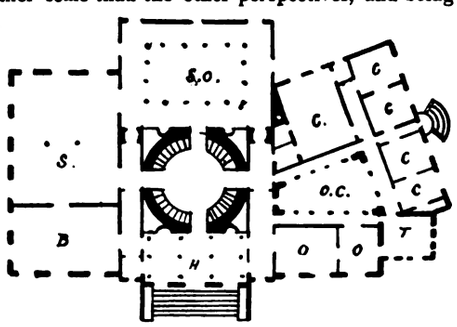
The building is unfortunately placed directly on the street line. The front on Seventeenth Street is treated as if it were the main building. The corner and, judging from the perspective, the New-York-Avenue front is treated as if it were an annex. The New-York-Avenue front will, when used, be the most important one and the corner of intersection is the view which the larger number of people will obtain of the building. The portion on Seventeenth Street as a detached part is simple and Classical. The massing and general arrangements were evidently intended to convey the idea of massiveness, durability, strength, instead of refinement, grace and beauty.

The treatment of the roof in no way indicates the manner in which it could actually be built. In the perspective, the corner does not agree with its form as shown on the plan. The treatment of this important corner is the evident weak spot in the design.

P. G. Pelz gives another plan in which the whole available street-front is utilized. The entrance is from the corner. The sculpture-hall extends around Seventeenth and E Streets, well lighted by windows, while back of it and parallel to it are the bronze-galleries. The front on New York Avenue is devoted to the class-rooms. Above the sculpture-gallery are a series of picture-galleries on the streets with water-color galleries facing the interior court.

This seems to be a simple, business-like scheme, without any effort at large or effective rooms, being small rooms simply to show the pictures and statues to advantage, and arranged so that visitors would not fail to go directly through the building from room to room. The corner is capped with a dome, making this portion of the design the most prominent feature. The whole is a straightforward Renaissance in its method of treatment.

The scheme submitted by Robert Stead contemplates only a plan for immediate construction. The arrangement of class and administration rooms in a detached wing is, in my judgment, to be commended. The large central hall leads directly into the sculpture-halls on the first floor, and into the galleries for paintings over a portion of them on the second floor. The design is Renaissance and has quite a prominent tower on the corner of Seventeenth Street and New York Avenue. It is suggestive of Italian work, the details and groupings being carried out strictly on a Classical basis. The dome of Mr. Pelz's and the tower of Mr. Stead's are so placed that they would not cast shadows across the skylight. The pen-and-ink perspective is a good piece of drawing but being drawn to a much smaller scale than the other perspectives, and being in simple



Robert Stead, Architect.

black-and-white, while the others are in color, it is overshadowed by the size of its neighbors on the wall.

This competition, if it may be called one, shows clearly the difficulties of comparison where the drawings are made in different styles, and drawn to different scales, and the mistake an architect makes who enters a competition where one of the competitors has been working with and is familiar with the ideas of the building-committee.

LABOR COMES TO THE AID OF CAPITAL. — To prevent a general shutdown of the Chambers glassworks at Pittsburgh, the Workers' Union met and decided to loan the company from its surplus funds the sum of $50,000. Who dares say now that Labor is the enemy of Capital! — *N. Y. Commercial Advertiser.*

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AUSTRALIA.

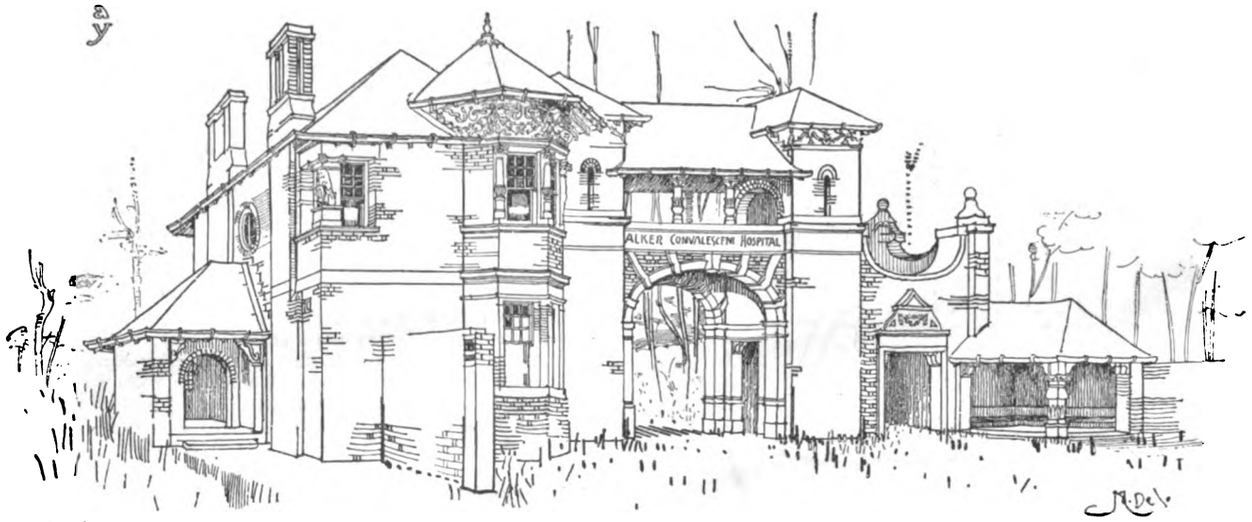
THE MUTUAL LIFE INSURANCE BUILDING. — THE WALKER CONVALESCENT HOSPITAL. — PROPOSAL TO PROCURE A RAILWAY COMMISSIONER FROM AMERICA.

SYDNEY, N. S. W.

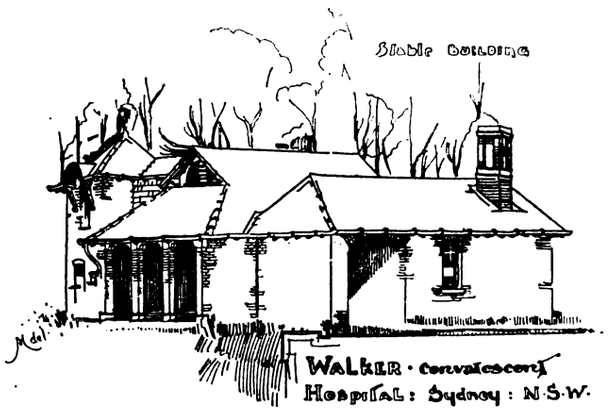
THE strike of masons engaged on the new offices for the Mutual Life Insurance Company of New York, to which I have previously referred, has not interfered in any way with the rapid progress of the building. The architect of this fine structure is Mr. John Kirkpatrick of Sydney, whose design was awarded first place by the New York committee of management in a competition which took place some time ago, and which has been spoken of before in these letters. Mr. Kirkpatrick has been singularly successful in contests of this kind, his designs having been premiated in every competition of note held here during the last few years. The Mutual Life Insurance Building is to be of a free Renaissance type, and will when completed, divide with the new Equitable offices, the distinction of being the largest block of office-buildings in Australia. These two great edifices are within a few yards of each other, and though the Equitable is an exceedingly fine example of American Romanesque, which as an architectural style has all the advantages of novelty in Sydney, still, I think, the Australian architect will have nothing to fear with regard to the comparisons which the size and proximity of the two structures will inevitably elicit. I speak only with regard to the exteriors; the respective merits, or demerits, of the planning I know nothing of, as no opportunity has yet been offered of inspecting the drawings in either case; though in matters of arrangement Mr. Kirkpatrick is not likely to be behind, for planning is considered to be his strong-point.

There has lately been opened here a Home for Convalescents which has been called after its founder the Thomas Walker Hospital. By the rules of this hospital it is stated that "it was founded and privately endowed for the purpose of affording the advantages of change of air and proper care and diet in a comfortable home to those requiring, but otherwise unable to obtain, these essentials to perfect restoration to health." The Hospital is built at Concord on the Parramatta River, and the intention is to carry out the wishes of the founder without asking for any contributions from patients, the public, or the Government. When it is stated that about £75,000 have been spent on this institution, exclusive of the value of the site on which it stands, some idea may be formed of the munificence of the bequest, especially as the number of patients is at present limited to sixty-two. Architecturally the hospital has been most successfully treated: the planning is excellent and the general effect eminently picturesque. The buildings have been erected from the designs of Messrs. Sulman & Power, architects, of Sydney, and are of an Italian type of architecture. They are constructed of red brick, with stone facings, and are covered with tiled roofs of a low pitch, having great overhanging eaves. These eaves, and the masses of shade produced by deeply-recessed verandas and balconies, give a character to the structure which is unfortunately lacking in most

Gate Way



Walker Convalescent Hospital





Walker Gate

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Australian buildings. It was pointed out some time ago in a paper read before the Institute of Architects of New South Wales, that the besetting sin of nearly all the work erected here is its flatness: "Here in the old Georgian time the builders with the simplest means, and nothing more decorative than a coat of limewash, attained good results; but it was principally because they recognized the value of shadow, and left broader and bolder wall-surfaces than we do." Most of our buildings look as if they were cut out of cardboard.

A charming feature of the building under notice is the water-gate by which the visitor approaches the hospital from the river. Another characteristic gateway adorns the entrance on the land side.

Owing to the scarcity of work in Melbourne it has been found necessary to have the architectural staff in the Works Department reduced; and the President of the Institute of Architects of New South Wales has also deemed it incumbent on him to publish a letter in the *Journal* of the Royal Institute of British Architects, warning draughtsmen not to come to Australia without first making careful inquiries as to the prospects of obtaining employment.

The Government of Victoria will shortly find it necessary to appoint two Railway Commissioners in place of some of those who retire in March next. The Premier who was struck with the management of the railways when he was travelling a few years ago in the United States, is of opinion that it would be advisable to select a successor to the present Chief Commissioner from among the traffic-managers on the American lines. The salary in connection with this office is about £3,000 per annum, and as the Commissioners are appointed for a term of years, and are not subject to political interference, there should be no difficulty in getting a competent man for the post.

SOCIETIES

T-SQUARE CLUB.

A MEETING of the T-Square Club was held at the club-rooms, January 17, the subject for competition being a "Club-house for a Rowing-Association." There were eleven designs submitted. First mention was awarded to Wm. C. Hays; second mention, Geo. B. Page; third mention, David K. Boyd.

The next competition was announced "A Monumental Column to commemorate a Battle." Required drawings: plan and perspective view rendered in color. GEO. BISPHAM PAGE, *Secretary.*

WASHINGTON CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

AT the meeting in January, the Washington Chapter A. I. A., held its election of officers with the following result:

Glenn Brown, *President;* Robert Stead, *Vice-President;* Leon E. Dessez, *Secretary;* C. A. Didden, *Treasurer;* J. Rush Marshall, J. G. Hill and J. C. Hornblower, *Committee on Admission.*

The officers and Committee on Admission constitute the Executive Committee.

WORCESTER CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS.

AT the regular monthly meeting of the Worcester Chapter of the American Institute of Architects, held at Geo. H. Clemence & Co.'s Office, Walker Building, the following officers were elected for the year:

Elbridge Boyden, *President;* Stephen C. Earle, *Vice-President;* Clellan W. Fisher, *Secretary* and *Treasurer.*

The reports of the past Secretary and Treasurer were read and accepted. The new Secretary was instructed to prepare a letter addressed to Secretary of the Treasury Carlisle, urging upon him the opening of the designing of Government buildings to competition by private architects. A general discussion followed on foundations, cements, etc.

ILLUSTRATIONS

[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

ORGAN-LOFT IN THE CONGREGATIONAL CHURCH, PROVIDENCE, R. I. MESSRS. CARRÈRE & HASTINGS, ARCHITECTS, NEW YORK, N. Y.

[Heliochrome, issued with the International and Imperial Editions only.]

IN the interior, the Guastavino vaults are very similar to the brick on the exterior, excepting in texture. The ornamentation and plain surfaces are of plaster, which is painted a gray, somewhat similar to the color of Indiana limestone. All the woodwork is painted about the same color as plaster, and much of the ornamentation is gilded solid, matt. The Ionic columns in the transepts and main nave are of terra-cotta. The pews are of oak, natural finish; also all of the altar furniture and other furniture; the ornamentation being of papier-maché, and gilded solid. The decorations of the chancel are very rich in color, and not easily described. It was very interesting to the architects to have to do with a committee where every man was in absolute earnest, to the extent of travelling to New York, Philadelphia and other cities to examine the materials that were to be used, when they objected to them, but still liberal enough to be finally convinced that they were satisfactory, and to acknowledge the fact when they had seen them.

MERCHANTS' NATIONAL BANK, NEW BEDFORD, MASS.: THE MAIN VESTIBULE. MESSRS. CHAPMAN & FRAZER, ARCHITECTS, BOSTON, MASS.

[Issued with the International and Imperial Editions only.]

ENTRANCE TO SAME BUILDING.

[Issued with the International and Imperial Editions only.]

DETAIL OF ONE BAY OF SAME BUILDING.

[Issued with the International and Imperial Editions only.]

IMPROVEMENT OF TWELFTH STREET, ST. LOUIS, MO., AS SUGGESTED BY MESSRS. STEWART, MCCLURE & MULGARDT, ARCHITECTS, ST. LOUIS, MO.

APROPOS of the suggested improvement of Twelfth Street mentioned in the *American Architect* for December 23, 1893, we reproduce the design prepared by the above-named architects at the instigation of a syndicate interested in the scheme.

The picture is not intended to represent an exact or settled plan, but to embody in suggestive form the general idea of the proposed improvement. The idea is one that has been persistently set forth in the columns of the *Post-Dispatch*, and now that the property-owners in the district and the city officials have awakened to the grand opportunity Twelfth Street affords St. Louis to construct, at comparatively small expense, a boulevard which will be famous the world over, they have taken the matter in hand and by their united efforts promise to completely change the present character of the street within the next five years. The plan here shown provides for the widening of Twelfth Street, from Franklin Avenue on the north to the entrance to the Twelfth Street Bridge on the south. This it had been suggested should be done by the city by condemnation proceedings in order that there might be no delay caused by property-owners who did not want to act in concert with the others.

This would make Twelfth Street a grand boulevard 175 feet wide. This is a matter which has already been considered and recommended by the Street Department. The sections that would have to be condemned to make this width would be from Market Street to Clark Avenue and from St. Charles Street to Franklin Avenue. Then to obviate the danger incident to crossing so wide a street, a midway path is constructed down the centre of the thoroughfare made of granitoid or tiling. This is to be thirty-five feet in width and along its length, at intervals, ornamental monuments could be erected. On either edge a high curb of at least one foot would be erected to prevent vehicles from coming too close to pedestrians and immediately next to this pathway the street-car lines would be placed. This would leave a space of seventy feet on either side to the building-line, or fifty feet clear for traffic, allowing twenty feet for sidewalk purposes. A new idea also is to avoid tacking up signs on posts or houses to identify the streets by having their names inlaid in large letters in the granitoid sidewalks.

These improvements, magnificent as they are, will not make the street famous: it is the character of the buildings that may line it that will make it historic.

At present there is much talk of a new court-house, of which, setting aside sentiment, the city is really in need. The old city-hall will soon be vacant, and by the sale of this property and the court-house the city would realize sufficient cash to purchase the west half of the block in which the city-hall is located — that is, the half fronting on the east side of Twelfth Street between Market and Chestnut Streets and to almost complete a new court-house. The half-block in question would cost the city about $500,000 and the new court-house about $1,500,000, a total expenditure of $2,000,000. With two such buildings on Twelfth Street, the success of the Twelfth-Street plan would be assured. — *St. Louis Post-Dispatch.*

HOUSE FOR MRS. LADEW, GLEN COVE, LONG ISLAND, N. Y. MESSRS. ROMEYN & STEVER, ARCHITECTS, NEW YORK, N. Y.

THIS building is now in course of construction and will cost about $25,000.

MERCHANTS' NATIONAL BANK, NEW BEDFORD, MASS. MESSRS. CHAPMAN & FRAZER, ARCHITECTS, BOSTON, MASS.

THE BANK OF NORTH AMERICA, PHILADELPHIA, PA. MR. JOHN T. WINDRIM, ARCHITECT, PHILADELPHIA, PA.

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[Additional Illustrations in the International Edition.]

BALCONY OF THE HÔTEL CZARTORISKY [FORMERLY HÔTEL LAMBERT], ILE-ST.-LOUIS, PARIS, FRANCE.

[Copper-plate Etching.]

THE building which this balcony adorns was built about the middle of the seventeenth century by the architect L. Leveau, for the President Lambert de Thorigny, and at that time the interior was decorated by Lesueur, Lebrun and Perier. The building was carefully restored in 1860 by M. Lincelle who took the greatest care to preserve its original character. It is probable that the sculpture shown in this plate was modelled by the Flemish sculptor, Van Opstal, under the direction of Lepautre. The building is one of the "show places" of what is left of old Paris.

DETAIL OF THE FRENCH GOVFRNMENT BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. M. RENÉ DUBUISSON, ARCHITECT AND M. HENRI MOTTE, SCULPTOR AND DECORATOR.

[Gelatine Print.]

S. FAGAN'S CASTLE, CARDIFF, WALES. — FRONT VIEW.

PROPOSED CAFÉ FOR THE SCARBOROUGH CLIFF BRIDGE COMPANY. MESSRS. BEDFORD & BARRY, ARCHITECTS.

THE illustrations show a proposed café to be erected at the south end of the promenade of the Scarborough Spa. The authors have arranged the café on the first-floor level, with a veranda running round, facing the sea and promenade. On the ground-floor below the café, are the kitchen, larder, etc., with shops and a porter's lodge adjoining the entrance from the beach. It is proposed to carry up the sea-wall to the café level, the upper portion to be built in half-timber work, with a tiled roof. The alternative scheme shows a one-story building at the side of the promenade and facing the sea.

BOAT-HOUSE, RUDYARD LAKE, LEEK, ENG. MR. LARNER SUGDEN, F. R. I. B. A., ARCHITECT.

THE boat-house (with fishing-lodge above) is strongly built of red stone got on the shores of the lake, with brindled-tiled roofs and gables, brick chimney and rough oriels. The bridge, which is of cleft oak, rests on stone piers. There is sixteen feet of water on the boat-house sill at high water as shown in the drawing. The windows of the fishing-lodge are glazed in lead-lights, but those of the boat-house beneath are left open. The effigy of the Lady of the Lake is an old ship's figurehead, of unusual merit, picked up in a Bristol yard, which must have "sailed the Spanish main" for centuries, but is come to an anchorage in still waters at last.

S. GIORGIO MAGGIORE, VENICE, ITALY.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

THE MEDFIELD ASYLUM MATTER: A CORRECTION.

BOSTON, MASS., January 17, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I received a marked copy of your paper January 6, 1894, with its editorial criticism on the Medfield Insane Asylum.

The editorial contains a number of mistakes, especially in its statement that the work has been going on and is without the supervision or direction of any architect. Permit me to say there never has been a minute when the work has not been under such supervision. Upon the discharge by the Commission of their late architect, Mr. Tobey, they immediately employed Mr. Wentworth, an architect of good character and standing, I believe, in his profession, who drafted the plans originally of the asylum and who has since the discharge of Mr. Tobey, had full charge, as architect, of the construction of the buildings.

Your further statement that the contractors were invited to name some person to whose satisfaction they would consent to do their work, is also clearly erroneous. A difference having arisen between the contractors and the Building Commission as to payments to be made on account, and claims for extra work, an arbitrator was appointed by both parties to adjust these differences. I suppose such a course is not only proper and expedient, but a very usual proceeding under such circumstances.

Yours truly, WM. E. RUSSELL.

[As Governor Russell when in office did not make a practice of correcting mistakes that appeared in the public prints, we must, apparently, have gone farther astray than we thought possible in our comments on the Medfield Asylum matter, since he now finds it worth while to make the above corrections. We can only say that our remarks were not intended to do injustice to any one. — EDS. AMERICAN ARCHITECT.]

NOTES AND CLIPPINGS

A PHILADELPHIAN'S PRESENCE OF MIND. — There are a good many stories about presence of mind, and M. Dupuy's behavior in the chair of the House of Deputies when Vaillant threw his bomb has been the means of recalling some of them. Few are more worthy of being held in remembrance than that told by "R. P. S." in the current number of the *Spectator*. It refers to an incident which happened fifty years ago, but has never become widely known. A collection of Chinese treasures, very rare at that time, as coming from what was then known as the sealed kingdom, was on view in Philadelphia before being brought to London. A meeting was being held in a long and narrow, but lofty upper room above the exhibition. About 3,000 persons were present. At near 9 o'clock the manager of the building came to the leader of the meeting, white with fright, and told him that the floor had sunk nearly a foot, and that in a few minutes more the tenons of the joists might be out of their sockets. The floor would then fall through onto the Chinese museum, and the walls, sixty feet in height, would collapse and be precipitated, with the roof, upon the assembly. This might have caused the death of those present — the foremost people in Philadelphia. The leader explained to the person whom the audience expected to hear that by addressing the assembly from the end of the hall he could withdraw the company from the sunken part of the floor to that where the front walls strengthened the joists to bear the weight of the people. The reply to this was that his family was in the audience, and that he must get them out first. "You shall not," said the leader. "A hint of danger, — a rush — and we shall all be under the fallen walls and roof. Five minutes delay may kill us all together." "R. P. S." continues: "As a boy in the audience I can well remember my surprise at seeing the leader suddenly appear at the far front of the room and tell the people that they would next be addressed from where he stood — the organ-loft. As the audience turned and moved to the front the flooring rose six inches. The people were entertained, partly by an impromptu sentimental song, in a voice without a quaver, in the very face of death, and as soon as practicable they were quietly dismissed. Not a single individual in that great assembly was aware that, by the presence of mind of one man, an awful catastrophe had been averted." — *London Daily News.*

NEW YORK CITY'S AREA. — How many people have ever stopped to inquire how many dwelling-houses there are in New York City? There are 81,828, with an average of 3.82 families to a house and 5 persons to a family, or 19 persons to a house. Twenty years ago the average was 14. Ten years ago it was 16.5. Ten years hence, from present appearances and at the present rate of increase of flats and apartment-houses and the abandonment of small brick dwellings, it will be 22. New York does not stand very high on the list of American cities in respect to area, being, in fact, the smallest geographically of any of the big cities except Baltimore, Cincinnati and Brooklyn. New York covers about the same area as Fall River, Buffalo, Denver, Duluth, or Sioux City. Chicago is four times as large, Philadelphia is three times as large, and New Orleans, St. Louis and Washington cover territory 50 per cent greater. Des Moines, St. Paul and Minneapolis are each of them larger than New York. San Francisco, one-sixth of the population, is slightly larger. Advocates of a "greater New York" find encouragement in the fact that the population of the two cities of New York and Brooklyn, exclusive of outlying towns and regions included in the scheme, would foot up 2,915,000 against 2,447,000, the population of Paris, and 4,230,000, the population of London. New York-Brooklyn would then be the second largest city in the world. New York is now third and Brooklyn the tenth. Together they would have an area of 68 square miles. The area of London is 122 and of Paris 29. New York is one of the healthiest cities in the world, and is becoming more so each year, the death-rate from consumption, for instance, now being 3.09 against 3.89 in 1880, 4.41 in 1872 and 4.65 in 1865. — *N. Y. Sun.*

FLEXIBLE STONE. — Flexible stone, though by no means a novelty, is a material with which every one is not acquainted. Most museums containing geological specimens have a piece of elastic or flexible sandstone in the collection, but looking at it through a glass case is not an altogether satisfying process. The peculiarity of the stone is that, while it looks like an ordinary piece of sandstone, it is capable of being bent in the hand with considerably less force than is required to bend a piece of wet leather of equal thickness. When examined with a lens, by reflected light the particles of which it is built up are seen to be movable individually by using a needle-point. When a thin slice of the stone is looked at under a lens by transmitted light, the fragments are seen to be locked together, like the parts of a section puzzle-top, fixed, but only loosely. — *Invention.*

PIRATED FRENCH STATUETTES. — A decision was given at Paris last week in favor of the Soleaus against the Meriden Britannia Company of Meriden, Ct. Judgment was also given against Simpson H. Miller of Wallingford, Ct. In the former case the Company was comdemned to pay a fine of 1,000 francs and to publish the judgment in 10 newspapers. In the case of Miller the court ordered that he pay a fine of 1,500 francs and also publish the judgment in 10 newspapers. The plaintiffs charged that the defendents "pirated" French statuettes, the original models of which were owned by the plaintiffs. It was stated during the trial that the defendants, by supermolding, reproduced thousands of these statuettes, and these were sold not only in America but in France, at less cost than the Soleaus charged for their copyrighted production. The case had been pending for two years. — *Springfield Republican.*

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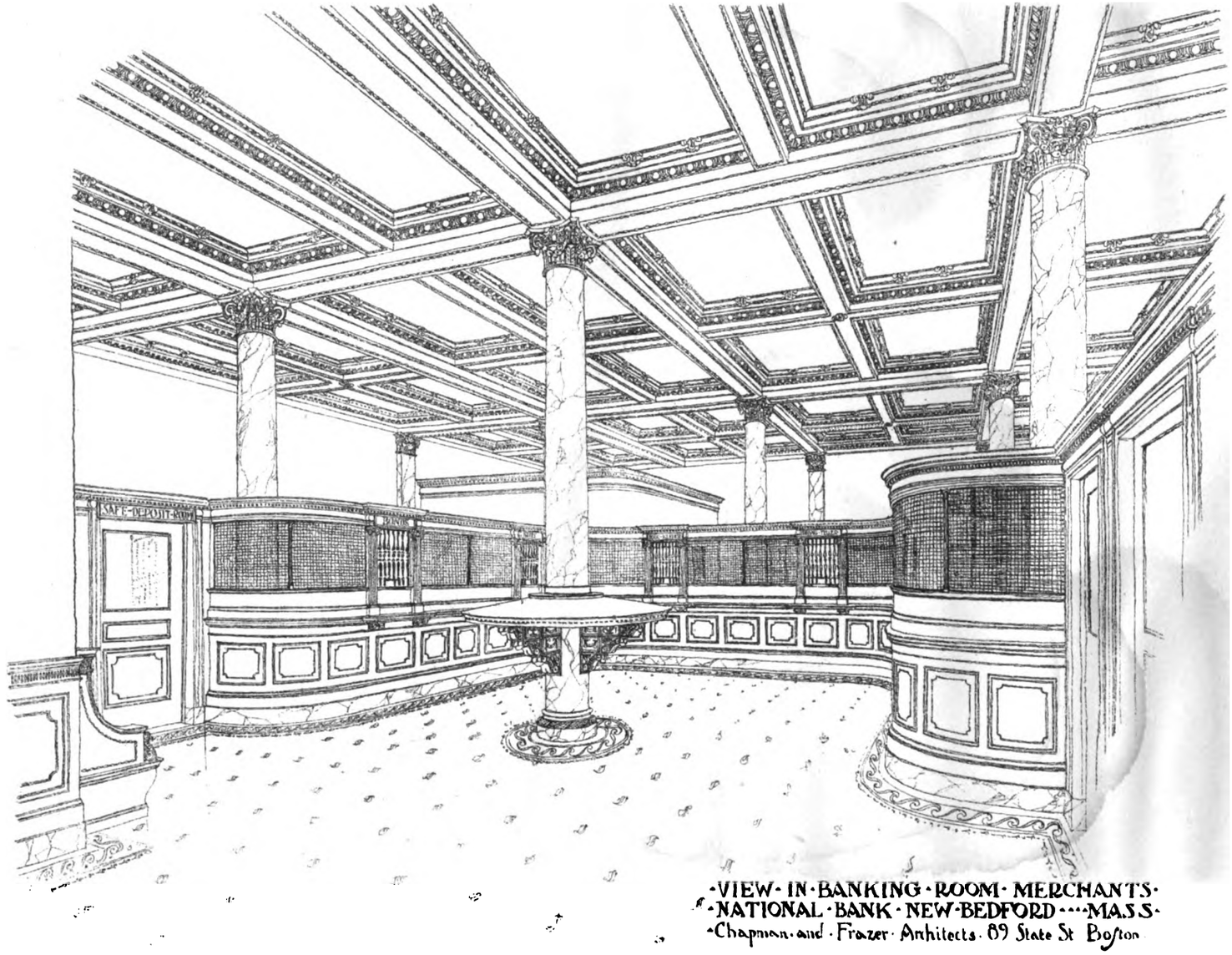


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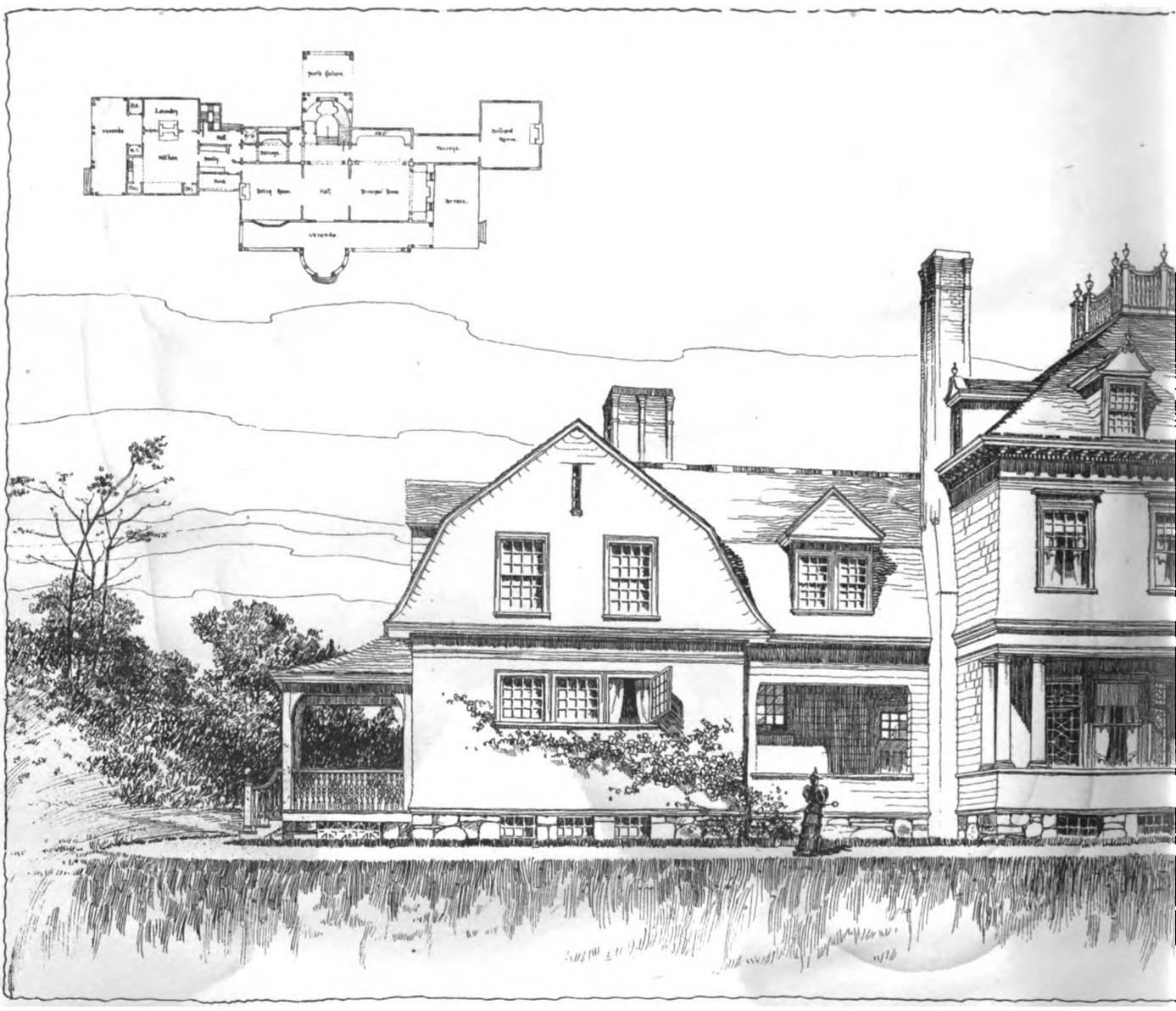
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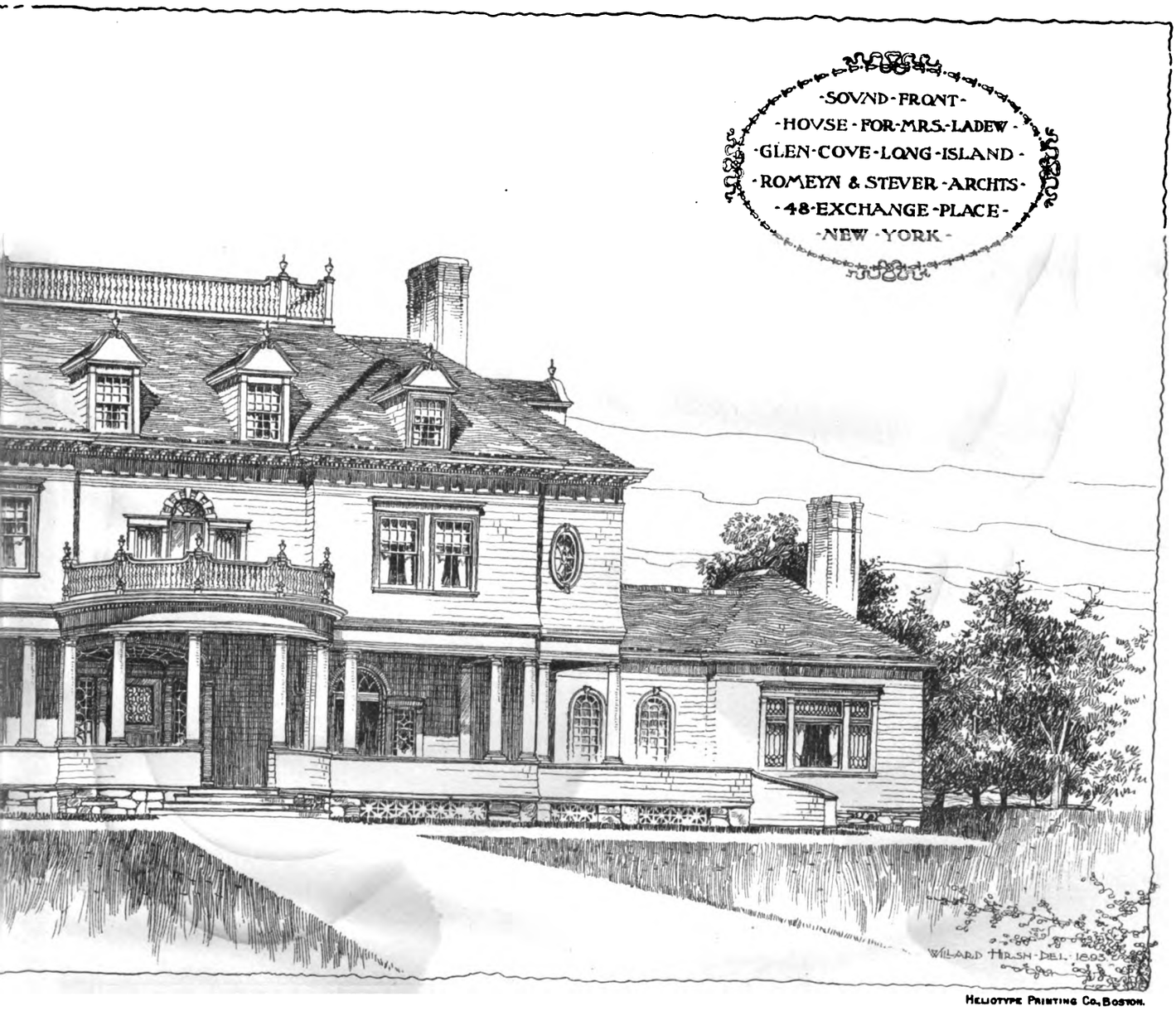
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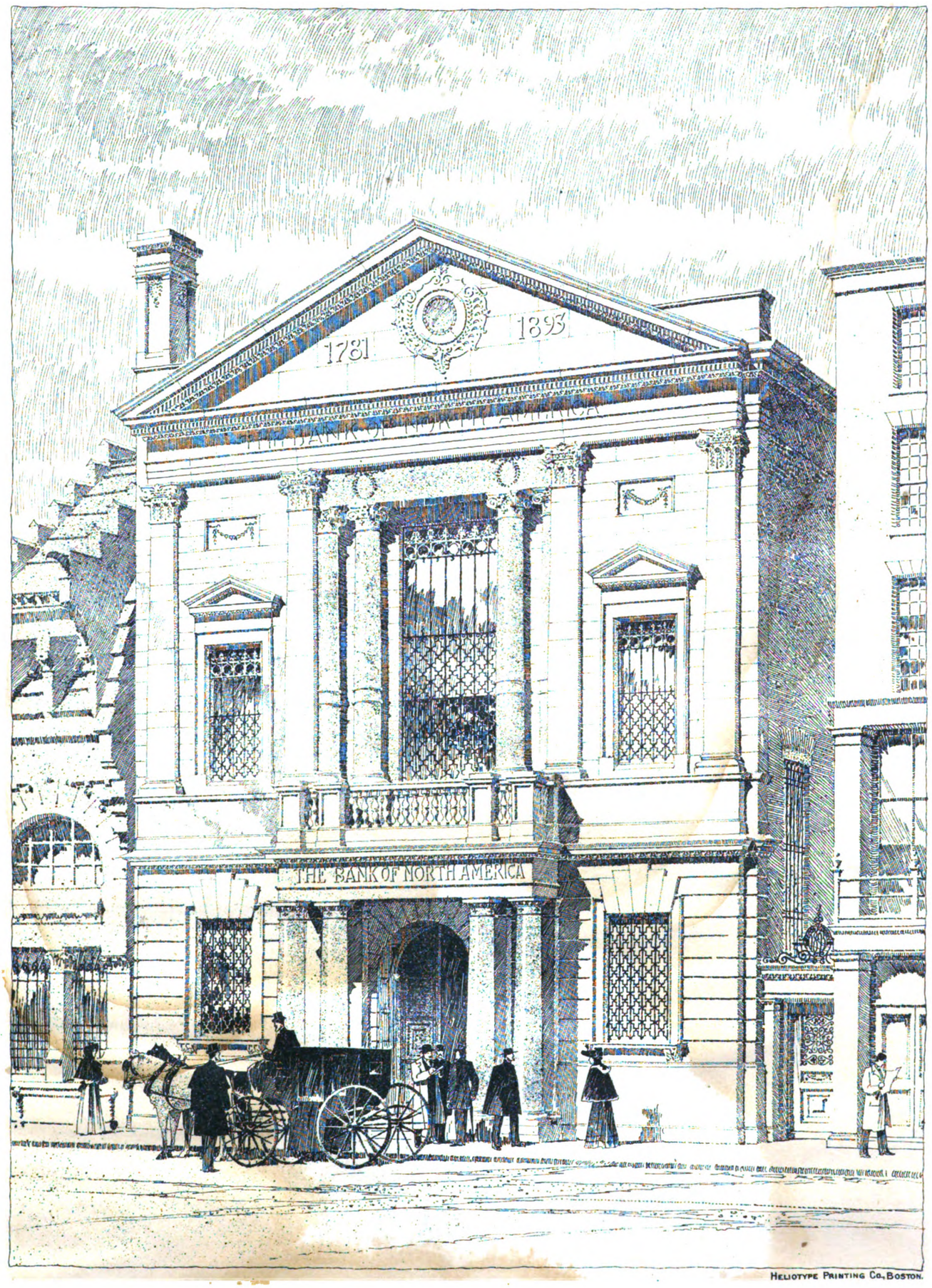


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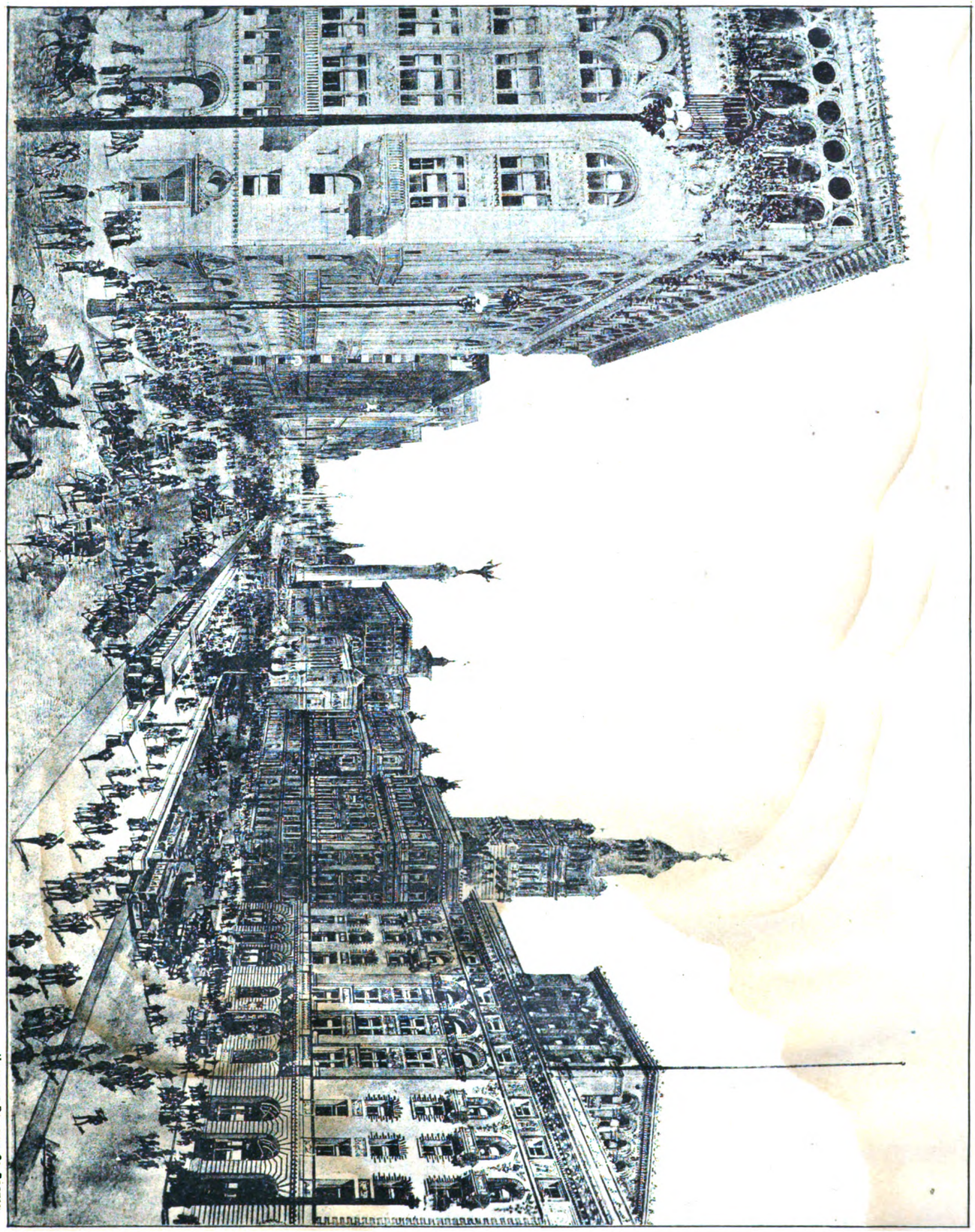
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SUGGESTED IMPROVEMENT OF TWELFTH STREET, ST. LOUIS, MO.

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FEBRUARY 3, 1894.

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SOME of the younger architects in New York seem to have originated a movement which may become important hereafter. Under the name of the Beaux-Arts Society, a corporation has been formed, intended, as its articles of incorporation say, "to cultivate and perpetuate the associations and principles of the École des Beaux-Arts, of Paris, and to found an Academy of Architecture, for the purpose of architectural exhibitions and training, and to establish and maintain a library of architecture, and also a club-house." The Trustees of the Corporation are Messrs. Charles F. McKim, Ernest Flagg, Richard H. Hunt, Walter B. Chambers, William A. Boring and John M. Carrère. As New York already possesses a school of architecture of the highest class, modelled, so far as its teaching of design is concerned, on the Paris École des Beaux-Arts, besides a beautiful exhibition-hall, and an admirable library of architecture, to say nothing of the League rooms, which form as pleasant a club-house as a young architect could wish to be admitted into, it is not easy to see what pressing need remains to be provided for by the "Beaux-Arts Society," but the Trustees of the new Society, at least, are well known for their wealthy and influential connections, and if they can show that they have in hand a work of real use, the public has confidence enough in them to respond liberally to any call for pecuniary support that they may make.

BOSTON architects should not fail to note a recent decision of the Board of Appeals on the question of what constitutes a basement. Under the new building law, every building more than four stories in height must have the two lower stories of fireproof construction; and another provision of the statute defines a basement as a lower story having more than half its height below the level of the street. A firm of architects designed a house, containing four stories entirely above ground, and one story buried in the ground so far that the middle line of its height, while slightly above the curb level, was considerably below the grade line of the grass-plot which intervened between the house-front and the sidewalk line. The plans and specifications called for nothing more than the usual construction; but the Inspector of Buildings, perceiving, from the elevations, that more than half the height of the lowest story would be above the curb level, held, as he was bound to do, that, as this was not the basement story, under the definition given by the statute, it could be nothing else than a regular story, and the building was therefore five stories in height, and must have the two lower stories fireproof. It would seem as if the difficulty might be easily met by excavating the cellar a few inches deeper, so as to lower the median line of the basement to the necessary extent to satisfy the law; but the statutes regulate the level of cellar floors in Boston, and the necessary lowering could not be effected without contravening the law in another point, or unduly reducing the height of the basement ceiling. In this perplexity, the parties carried their case to the Board of Appeal, which has now decided that the statute provision is intended to apply strictly only to buildings fronting substantially on the street-line; and that where a grass-plot, graded toward the street, intervenes between the house-line and the sidewalk, a lower story, the middle line of whose height comes below the ground-line, at the building, is to be regarded as a basement, although such middle line may be above the line of the curb.

MR. GEORGE H. EDBROOKE, an architect widely known in Chicago, where, with his father a well-known contractor and his brother who was Supervising Architect under the last administration, he lived for many years, and known also in New York, where he had of late practised, died in the latter city, by suicide, a few days ago. Mr. Edbrooke, both in Chicago and New York, enjoyed an excellent reputation, and had a good business. His last important building, the Brooklyn Savings Bank, which is to cost about a quarter of a million, is not yet complete, and he had recently finished another building of about the same value. He also designed the Adams Express Company's building, and one of his buildings in Chicago is that on Clark and Lake Streets for the Sibley Seed Co. Notwithstanding his success, or, perhaps, as a consequence of the mental strain incident to so much responsibility and anxiety, he had of late fallen into despondency, the preliminary stage, no doubt, of cerebral disorganization.

A GREAT deal of talk has been made within the last week or two in connection with the design for the Columbian medal. The dies for the medal are in preparation at Washington, and the medals themselves are to be struck at the Mint. It seems that Mr. St. Gaudens, the designer, naturally kept his model from public view until it should be delivered to the Government officials, and this conduct served to sharpen the public curiosity in regard to it. The managers of the Page Belting Company, of New Hampshire, to whom a medal had been awarded, took it into their heads that a drawing of the medal would form an interesting decoration for the new calendar which they proposed to send to their customers at the beginning of the year; and, as the medal itself was not yet available, they sent a draughtsman to Washington, to make a drawing from the dies, or from Mr. St. Gaudens's model. The draughtsman was shown the plaster model, and made, from memory, it is said, small drawings, which were engraved, and appeared in the Belting Company's calendar as representations of the Columbian medal. No sooner had the calendars been distributed than protests began to be heard against the design of the medal, as shown in them. The matter was called to the attention of the Senate Committee on the Columbian Exposition, and the members of this committee, after examining the model, requested the Secretary of the Treasury to have work on the dies stopped, on the ground that the nude figure represented on the reverse of the medal was indecent. Secretary Carlisle thereupon wrote to Mr. St. Gaudens, inviting him to design some drapery for his figure, and the intimation was made that, if he did not wish to do so, the Treasury designers would provide it; or, if he objected to having his model tampered with, it would be abandoned, and a different design, by another artist, would be immediately prepared and carried out.

THIS communication appears to have found Mr. St. Gaudens in a very unamiable frame of mind. To the reporters who called to see him on the subject he said, according to their account, that he would not change his design, or make another; and he is alleged to have characterized the draughtsman who made the picture of it for the Page Belting Company as an "idiot," and a "New Hampshire ass." More than this, it

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is said that Mr. St. Gaudens has employed counsel to demand damages from the Belting Company for caricaturing his work. The last circumstance introduces a curious complication into the dispute. In order that a jury may determine just how much damage Mr. St. Gaudens has suffered at the hands of the Page Company's draughtsman, it is obviously necessary that the original model, from which the drawing was made, shall not be altered before the jury sees it, and the Page Company has therefore taken the precaution to notify the Government officials not to change it, or, at least, to take an exact cast of it before alteration. What will be the result of the dispute no one can tell. The newspapers have, to a certain extent, taken sides in the matter, some thinking that it is absurd to object to a figure which is no worse than those on hundreds of antique coins and medals, while others support the Senate Committee in the belief that the design is not suited for its purpose. To our mind, the latter have the better side of the case. It is true that antique coins show nude figures, but antique coins were made for people who usually went half-naked, and to whom a short tunic, with a pair of sandals, was quite sufficient for the ordinary attire of a woman, and even superfluous luxury for a man. To people thus trained, a nude figure was no more shocking than it would be to a baby; but the fact that the Greeks and Romans, who were accustomed to seeing women doing housework *en chemise*, and field-slaves laboring in Nature's garb, endured, not, indeed, without remonstrance, the representation of naked persons in sculpture, by no means proves that we, who carry into private life the reserve and propriety which the ancients maintained only in public, show nothing but ignorance in objecting to the nudity of Mr. St. Gaudens' straddling figure. Whatever may be said of the representation made for the Page Belting Company, it is no "New Hampshire ass," but Mr. St. Gaudens himself, who chose the attitude of his personage, and one does not need to be prudish to find this attitude unnecessarily and obtrusively offensive. If an actual individual were to present himself in such a manner in the dressing-room of a swimming-club, he would be voted a cad by his associates, and it seems to us that Mr. St. Gaudens's idea, of presenting to the public the Genius of American Industry, or whatever else it may be, under an aspect which would be regarded in real life, even under the most intimate relations, as vulgar and insulting, has been very properly objected to by the authorities.

THE Municipal Council of Paris has for many years assisted boys who wished to enter the Department of Architecture at the École des Beaux-Arts, by granting them scholarships, in cases where they were too poor to pay their own expenses in the School, and yet showed talent and industry enough to indicate that they would distinguish themselves in such a career. Very recently, however, the Council has voted to discontinue all these scholarships, on the curious ground that there is now an "excessive number" of architects in Paris, and that it is "useless, and perhaps even dangerous" to encourage children to enter a profession "already so overcrowded." The Council, in passing the vote, unanimously declared that its action must not be taken as a reflection on the instruction given in the School of Fine Arts, but only as the result of a conviction that the results secured by means of the scholarships did not correspond with the sacrifices necessary for maintaining them.

THE *Architect* (London) assumes quite an individual and solitary position when, under as late a date as January 12, it speaks of the late World's Fair as the "costliest of architectural fiascos." We heartily hope that the insularity of the editor may not be disturbed, and echo his aspiration that it "would be more advantageous for people at a distance, if tourists who visited the exhibition could be persuaded to refrain from trying to convince those who wisely remained at home that the World's Fair was an event in universal history and inaugurated a new era." We hardly believe, however, that a good many German, French, Italian, Spanish and some English critics who are generally held to be as competent and well informed as they are broad-minded and amiable, can be induced to recall the opinions greatly at variance with that of the *Architect's* editor which they have already pronounced. If the Fair was a "fiasco" in any particular it was in its overshadowing the rights of exhibitors by the too great attractiveness of its architectural features.

LE GENIE CIVIL has a study of the subject of the disposal of city garbage, which is beginning to attract attention all over the civilized world. As usual in sanitary matters, the English have made more progress than any other nation, and many English cities, among them Manchester, Leeds, Birmingham and Southampton, get rid of their household wastes in the most effectual manner, by burning them. It is obvious that it is one thing to burn garbage, and it may be quite another thing to do so economically; but the English engineers have studied the best mode of applying heat, until they have succeeded in reducing the cost of incineration to a low, and comparatively uniform point. Where the work is carried on at a large scale, as at Southampton and Manchester, the fresh garbage can be reduced to dry cinders at a cost of about sixty cents a ton, the fuel being economically applied, and the waste-heat utilized in various ways. At Southampton, the waste-heat is used for making steam, a part of which drives air-pumps, and the compressed air from the pumps is led to various points in the sewerage system, and there applied to lifting and forcing the sewage through the pipes; while another part drives engines and dynamos, which supply some forty arc-lights, and two hundred incandescent-lights. At Hastings, the waste-heat is also utilized under steam-boilers, and the steam is employed to pump sea-water, for washing the streets and for flushing the public water-closets and urinals. In other cities, steam so obtained serves for cutting hay, for feeding horses, for mixing mortar, and for disinfecting clothing. The waste products from the garbage itself, as treated in England, are not of much value. The matters are completely incinerated, so that nothing remains but ashes and cinders, which are, however, ground with lime, and form a rough cement, which is sold for two dollars a ton, and answers for making pavements and artificial stone. In most parts of England, the serious mistake is made of picking out the tin cans, bottles and similar articles from the garbage before treating it. It is hardly necessary to say that anything which has once come in contact with waste matters of this sort ought to be sterilized by a high heat, before it is allowed again to get into human hands. No doubt, it would add to the cost of the process to roast the rubbish in the ovens with the garbage, and separate it afterwards, but this is nothing in comparison with the increased security so obtained. To show how extensive is the field for this sort of sanitation, *Le Génie Civil* remarks that the City of Paris gathers, and transports to the suburbs, eight hundred thousand metric tons of garbage and offal per year, at an expense of fifty cents per ton. To burn it would cost, under present conditions, about sixty cents per ton, and there would be a certain additional expense for transportation to the incinerating ovens; but, as it says, if we consider the cost of the sickness, loss of business, and loss of life, which would be avoided by a more hygienic mode of treating these dangerous substances, the balance is greatly in favor of the quick and effectual disposal by fire.

THE Hansa House at Antwerp, has recently been destroyed by fire. This house, as its name indicates, was built by the famous Hanseatic League, an association of trading towns in North Germany, for the accommodation of its Antwerp interests. Two-thirds of its cost was raised by subscription among the Hanse towns, and the remaining third was contributed by the municipality of Antwerp, which found the trade with the Hanse towns very profitable. The architect was Floris de Vriendt, of Antwerp. The building covered more than an acre of ground, and contained storage accommodations for the Hanse merchants, besides banqueting and reception rooms. At the time of its erection, in 1564, the Hanseatic League comprised one hundred and sixty-seven cities and towns. As time went on, many towns were detached from the League, through force or diplomacy, by the neighboring princes, until, in 1630, only one lifetime after the building in Antwerp of the splendid House of the Hansa, the League was reduced to three cities, Lübeck, Hamburg and Bremen. These three held, jointly, the title to the property for two hundred and thirty-three years more, but, as it lost its original use to them, they rented it for various purposes. It was for a time used as a Protestant church, but, when the commercial importance of Antwerp began to revive, it was taken for a grain store. In 1863, the three cities which owned it sold it to the Belgian Government, which, later, conveyed it to the municipality of Antwerp.

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THE FRENCH RENAISSANCE.[1] — I.

ALTHOUGH in the sixteenth century the French Renaissance followed the general direction dictated by the Italian Renaissance, its causes, sources and tendencies, not less than its characteristics, possess numerous wholly distinctive features, which proclaim the complete freedom of its movement in the presence of foreign influences.

The French Renaissance, like the Italian, made its début in sculpture, and, in this respect, it is first in date. Sienna, Florence and Rome were not yet out of their Byzantine swaddling-clothes, when the Cluny school of France, according to Viollet-le-Duc, but more accurately speaking, the Burgundian and Languedocian schools, began to exhibit well-defined indications of emancipation as regards conventional methods. But these matured in the Gothic style, which alone developed them and benefited from them.

All this is, moreover, inseparable from the normal progress of French sculpture. When, after four or five generations of artists had painfully trained themselves, sculptors felt that their eyes were sufficiently accurate and their hands sufficiently skilled, they cast aside their foreign models and approached the enlightened study of nature. The introduction of statues in the composition of tombs, in the twelfth century, forced them to portrait-work, a style in which they soon excelled and which has since become to us in a certain way national. About 1245, as soon as the basilica of Saint-Denis, which was being reconstructed by order of St. Louis, appeared far enough advanced, the King had rebuilt, at his own expense and with all possible magnificence, the sepulchral monuments of his predecessors; at the same time he had his own tomb executed, together with those of several members of his family. This great work and others of less importance undertaken in various provinces, notably at the court of the rich counts of Champagne, had the effect to keep artists in the beaten path, from which, however, nothing else tended to turn them. Whatever may be said to the contrary, the painters and sculptors of the Middle Ages did not hesitate to attempt to depict the nude. They had tried their hand at it, very unsuccessfully, no doubt, but with an evident aspiration toward something better, in the Romanesque edifices of Burgundy and Forez (this remark is suggested to us by a very convincing collection of designs shown us not long ago by a learned archæologist of Forez, M. Thiollier). They succeeded quite well in these efforts in the thirteenth century, of which no other proof is required than "this torso of Eve, modelled with extreme care, one of the most beautiful specimens of the art of the time, and which holds its place worthily in the first museum of France, among the masterpieces with which it is surrounded." It comes from the old rood-loft of the cathedral of Bourges, the remains of which were described in 1892, by M. Octave Roger, in a pamphlet full of interesting details.

The impetus was so strong that the movement was not affected by the Hundred Years' War. We see, on the contrary, fresh progress forcing its way, at most diverse points. We see sculpture, fettered for a time in the meagreness which architecture inflicted upon itself, escaping from an absolute dependence upon the latter. It is true that this movement was not universal or rather that it did not exhibit everywhere the same characteristics. Here, owing to its contact with architecture, sculpture was subservient to mannerism and commonplaceness; there it brooked no guidance except of its own accord, gradually meeting a marked decadence with a revival which was destined sooner or later to evoke other monumental forms.

A glance at the art of the second half of the fourteenth century will furnish important instruction as to this point. About 1340, there were executed at Toulouse, for the Cordeliers and at the expense of a bishop of Rieux, statues of the twelve apostles, "remarkable for a sincere and clearly expressed feeling for nature." Three courts, those of the popes at Avignon, Charles V at Paris, and the dukes of Burgundy at Dijon — to which may be added the court of the magnificent duke, Jean de Berry, and the unfortunately too ephemeral court of Louis d'Orléans — furnished work or protection to artists whose manner gives us clearer and clearer glimpses of a new era. Burgundy especially, safe from the shocks which involved the existence of the Capetian kingdom, and governed by princes fond of pomp and luxury, in the last ten or fifteen years saw produced, at Dijon, its capital, under the preponderant inspiration of the Netherlands sculptor, Claux Shuter, masterly works, which had a most striking effect upon mediæval art and commanded attention from far and near. From all parts of France sculptors came to the Chartreuse at Dijon to study the admirable statues of the well of Moses, the church portal and the sumptuous mausoleum of Philip the Bold. One alone, however, was able to carry home with him all the benefit to be derived from such a pilgrimage; this was toward the end of the fifteenth century; the artist was the immortal Michel Colombe, a Breton, who was not merely one of the precursors, but, so far as sculpture is concerned, the father of French Renaissance.

One may wonder why the architects stood so long with folded arms in the presence of the innovating tendencies of their brothers, the portrait painters. Let us say at once that a revolution in the art of building in the fourteenth or fifteenth century was not to the same degree imperative upon them.

Pointed architecture, forced by pitiless logic upon a career which a great social upheaval alone could have cut short, had not in the fourteenth century completed its necessary evolution, and, if this was accomplished in the following century, it was scarcely conceivable, even to the most receptive minds, what was to close it and succeed it. Barely is there discernible under Louis XI, notably at Notre-Dame de Cléry and at Saint-Aignan d'Orléans, an attempt, the possible consequences of which are deserving of notice. In the polygonal apses of these two edifices, owing to the dispositions of such a plan and to the difference of diameters which determined the excessive stilting of the *formerets* — a case, which had, moreover, often presented itself since the beginning of the thirteenth century, the *voutain*, half way up, at least, is merely a vertical partition, the monotony of which it was thought to relieve by introducing a rose-window with mullions. Carry up the partition to a level with the keys, replacing the bulging top of the vault by horizontal surfaces, make the partitions open-worked throughout, and you have the flat ceilings, supported by through-carved ribs, which make the church of La Ferté-Bernard, and Saint Peter's of Caen and of Tillières so piquant. Is it possible that this was the point of departure of those novelties that people were seeking? Although any change in the inner framework of the vaulting may be considered pre-eminently as pointing to the regeneration of architecture, it would be imprudent for us to pronounce definitely here, for the march toward antiquity in a way enveloped these transformations while they were in the process of being wrought.

It may, however, be affirmed with certainty that the revival of Greco-Roman traditions was not itself the inevitable goal of this rejuvenation of art, attempted or realized, in the fifteenth century.

Nor can we doubt that conditions were favorable to a return to the so-called Classic antiquity, from the Rhine to the Pyrenees, during the greater part of the Middle Ages. Under the Merovingians, Chilpéric and Brunehaut strove to this end in the arts, in literature and in institutions; and, under the Carlovingians, Charlemagne thought to have succeeded in the attempt by his palatine academy, by his edicts, by calling in the aid of numerous Italian or Byzantine workmen, and by the frequent use of columns and materials taken from ancient edifices. At the height of the Romanesque era, Provence and, to a certain extent, Burgundy, remained Classic in all that did not concern too closely the structure of the vaulting, maintaining the elements, profiles and ornamentation of the Ionic and, more especially, the Corinthian orders; Saint-Front of Périgueux revived a mass of details which, nine or ten centuries earlier, would have been very appropriate for the pagan Vesonna; the Corinthian capital, abandoned for a time in certain provinces for the godrooned capital, the cubical, the storied, and some others difficult of classification, regained its ascendency everywhere in the first half of the twelfth century and was instrumental in paving the way for the Gothic capital. Suger, the man who best represents and who really personifies the transition from the Romanesque to the Gothic, was brought upon Classic teachings; he knew Horace and Lucan by heart and cites them on all occasions; he saw the monuments of Rome and became enamored of them; he coveted for his basilica of Saint-Denis, the columns of the Baths of Diocletian; he adopted for the decoration of his façade, the old systems of mosaics and bronze doors. He moved forward only when forced to do so by the admission which his high

[1] From the French of Anthyme Saint-Paul, in Planat's *Encyclopédie de l'Architecture et de la Construction.*

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intelligence could not escape, of the needs of the monumental art at his time, an admission in its nature opposed to any backward steps. It was these circumstances, which his reason did not heed without a struggle, that made him an innovator. This kindly regard for antiquity was the prevailing spirit among his contemporaries. One of them even dared to address to the illustrious abbé, who was then living or had died but a short time before, a lyrical poem of wholly heathen versification and thought. At Saint-Denis also, a not very distant successor of Suger — it was in the middle of the reign of Philip Augustus — erected at the centre of the cloister a large stone basin for the ablutions of the monks, on which figure in medallions, with their names and attributes, the chief divinities of Olympus. It may be seen to-day in the second court of the Palais des Beaux-Arts at Paris.

But the structural principle which the basilica of Saint-Denis had seen decisively manifested soon became paramount to all existing tendencies and swept them away, especially when the applications of it were fixed by lay architects who were less bound down by tradition. From the beginning of the thirteenth century, architecture was launched by them upon a career which it was condemned to pursue to the last. Toward the close of the fifteenth century, this career seemed nearing its end; it was prolonged languishingly, protected by the constructors' spirit of routine. The maintenance of the Gothic style was also, doubtless, in a measure the result of Flemish influences which spread from the Vosges to the Pyrenees and which one finds, during the entire fifteenth century, represented by painters or sculptors from the Low Countries, in most of the art centres: at Paris, Bourges, Rouen, Angers, Toulouse and Arles, not to mention Dijon again.

Flanders, still more than France, clung to Gothic tradition; she proved this at home until the second half of the sixteenth century; she proved it under a quite piquant form during the reign of Louis XII, at Brou, near Bourg-en-Bresse, where, for the tombs, and, perhaps, also for the church, in the place of designs conceived in the Renaissance style by the Frenchmen, Michel Colombe and Jean Perréal, plans were adopted by the Flemings Van Boghem — who had charge of the work conjointly with Colomban of Dijon — and Conrad Meyt, which were unreservedly true to the old ideas. The Dijon school, Colombe excepted, in no way modified the condition of things which turned the eyes of Frenchmen toward the North rather than the South.

However, a movement in the direction of Italian teachings could not be indefinitely postponed independently even of the expeditions of Charles VIII and Louis XII, without which we could, if necessary, account for everything. In general, wars spread the arts but little; and, if the aforesaid expeditions did have some appreciable results, this was due to a few wealthy priests, fond of pomp and free from all artistic prejudices.

This does not mean that the immediate causes of the French Renaissance were, as in Italy, or in the same proportion as there, religious. The liturgy, which among us had so resolutely combated Greco-Roman traditions, in so far as they were inconsistent with the proprieties of Christian worship, and which had been amply satisfied by the creation of the Pointed structure, could not, while maintaining the same forms — and it was in no way yet disposed to sacrifice them — lightly return to the dispositions whose inconveniences it had so successfully obviated. The master-masons found here, then, in their routine, an ally, and at every insinuating or innovating proposition they could triumphantly ask, "Of what use?" The late Gothic, thin, complicated and stiff, was indeed shocking to good taste; but no matter, it had not failed in that for which it was originally designed. There, it was invulnerable.

It is in the motives less closely connected with the system of ribbed vaulting, in decorative or commemorative works, in the details and certain dispositions of seigneurial or bourgeois dwellings that the Flamboyant style could find successful rivals, and it is just there that it was attacked.

If we see prelates figuring honorably in the Renaissance movement, we must ascribe it less to the fact that they were priests than that they were feudal lords. Enriched by the privileges of the "commendam," which enabled them to accumulate the revenues of several livings, and but little absorbed by the needs of their abbeys or their cathedrals, which they neglected wholly or relegated to a secondary place, they sought glory in the construction of fine palaces, in adorning their churches, when they deigned to pay any heed to them, with purely decorative and easily executed monuments; they preferred to do this rather than sink their individuality in huge edifices that had been begun long before them, or in structures which, if begun by them, would probably, owing to their exceptional size, be finished, if ever, only after they were gone. For this reason, the great cathedrals had comparatively little to gain from the munificence of the princes of the Church during the sixteenth century.

It was in a tomb, erected not in one of the provinces near the Alps, but in the very centre of the basin of the Loire, that the Renaissance suddenly burst upon the vision of our ancestors, nearly a quarter of a century before the reign of Louis XII. This work, the origin of which M. Léon Palustre has recently discovered and discussed, is the mausoleum executed at Le Mans by the Italian Francesco Laurana, celebrated especially as a medallist to the Count of Le Maine, Charles of Anjou, who died in 1473. The tomb, which is quite like a cradle, rests on two narrow masses reinforced on each side by bands of black marble terminating in lion's claws. The height is occupied by a scotia, a broad curved surface and two cavettos; then comes a border of godroons, which form a sort of frame around the recumbent statue of the count. But the statue and the costume reflect the ideas of the Middle Ages. A cartouch, supported by two cherubs, bears the epitaph of the deceased, as in the ancient tombs.

This innovation was, however, too abrupt, too premature, and it remained a dead letter. In Le Maine we must come down to the year 1496, to see ventured, in the framing of the famous Saint-Sépulcre of Solesmes, a Corinthian capital and a few arabesques; at the same period and not very far from there, in the Angevin château of Le Verger (Fig. 1), a few

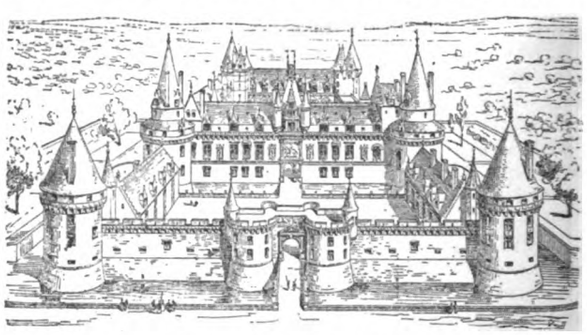


Fig. 1. Château of Le Verger.

analogous details are mixed with the Gothic, gradually taking precedence over the latter as the construction advances. This gradual introduction of the Renaissance elements was better suited to the situation of French art and of those who presided over its destinies, whether artists or rich amateurs; therefore, it marks distinctly the dawn of that noble period which was to be termed the "Age of Francis I."

[To be continued.]

PUBLIC SQUARES.[1] — I.

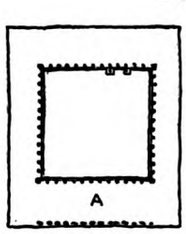


Fig. 1. Market Square, Delos.

In antiquity the planning of the city in general, and the public square in particular, was considered a work of art. Public places and public buildings were regarded by the Greeks and Romans as the best means of city decoration, and their remains and the restorations made from them show the magnificence and splendor of their architectural treatment. The public square of the Greeks, the agora, was the centre of political and commercial intercourse. In maritime cities, it generally lay near the sea; in inland places, at the foot of the hill on which stood the old feudal castle. Being the oldest part of the city, it naturally became the focus, not only of commercial and political, but also of religious life. In the older Greek cities it was not an artistic whole with a distinct architectural design; its confines were generally irregular. In the cities founded at a later period, a regular construction was followed which seems to have been initiated by the colonies of Asia Minor.

[1] A graduating thesis by T. M. Newton of the Architectural Department of Columbia College, New York.

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The description by Vitruvius ("*Architecture*" v. I.) of an agora evidently refers to the splendid structures of post-Alexandrine times. According to him it was rectangular in shape and surrounded by wide double colonnades. The numerous columns carried architraves

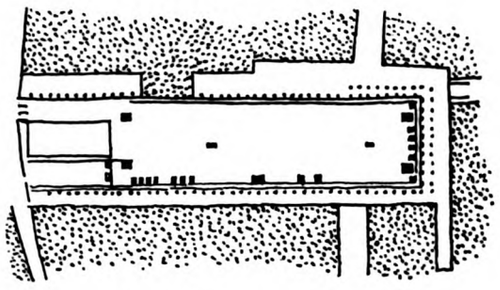


Fig. 2. Forum Civile, Rome.

of common stone or of marble, and on the roofs of the porticos were galleries that served as promenades. This, of course, does not apply to all the agoras even of later date; but upon the whole, the remaining specimens agree with this description of Vitruvius.

The beautiful market-place of Delos is shown in Figure 1. It lies on a terrace near the small harbor of the town, and consists of a quadrangular court surrounded by a Doric colonnade. The western colonnade has a number of doors which were the entrances into the agora from the terrace. Richer and larger was the agora of Aphrodisias in Caria. It occupied an area of 213 feet by 525 feet, and the enclosing wall was adorned on the outer and inner sides by an elegant Ionic colonnade containing marble benches.

The stoa, as an independent structure, was used both as an ornament of streets and squares and as a place for walks and public buildings. Its simplest form is that of a colonnade surrounded by a wall. This back wall offered a splendid surface for decoration, and was frequently adorned with pictures.

The entrance to the agora was marked by a gate of columns, temples and other public buildings; statues of the gods and heroes, and works of art were artistically arranged both upon and around it.

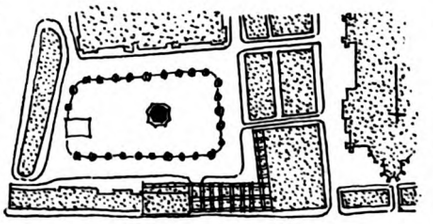


Fig. 3. Market-place, Lubec. 6m. x 85m.

The open places for worship were considered of the greatest artistic importance, and the temple-enclosures of the acropoles at Pergamon, Eleusis, Olympia and other places were in the highest degree noble creations of the art of building cities and public squares.

The forum was the public square of the Romans and the remains of the fora of Rome, Pompeii and other cities give us an idea of the grandeur of these parlors of the cities of antiquity. Many writers have described their construction and the life upon them. As in the Greek agora, we find here arcades, temples and similar monumental buildings as well as monuments, altars, and public places of worship.

From the *fora civilia*, reserved for civic intercourse, are distinguished the *fora venalia*, which were used for market-places and mercantile pursuits generally.

In Rome itself there were, besides the Forum Romanum, several other *fora civilia* originated by the growth of the city and by the desire on the part of the emperors to gain popularity by the erection of splendid structures for common use. Whole blocks of houses had frequently to be bought for the purpose. The Forum of Julius Cæsar, surrounded by double colonnades and adorned with the splendid temple of Venus Genetrix has almost entirely disappeared. We mention besides, the fora of Agustus, Vespasian, Nerva and of Trajan, the latter surpassing all the others in size and splendor.

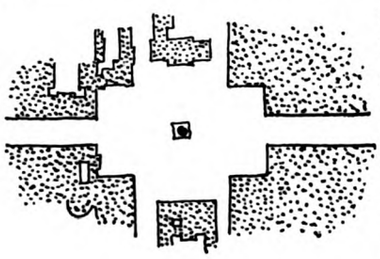


Fig. 4.

The fora were rectangular in shape, uncovered and enclosed on the sides, and were frequently used for exhibitions, gladiatorial combats and *palestra* (Fig. 2).

The characteristics of the forum were reflected in the interior courts of the dwelling-houses and in the modern interior courts of the palaces of southern European cities built according to the Roman tradition.

Among the squares of the Middle Ages are to be distinguished three, the "Signoria," the "Duomo" or church square and the "Mercato."

The Signoria was a square usually serving as the fore-square to the most important palace. It was often enclosed by an arcade or colonnade which served as a loggia to the surrounding buildings and also as a covered walk.

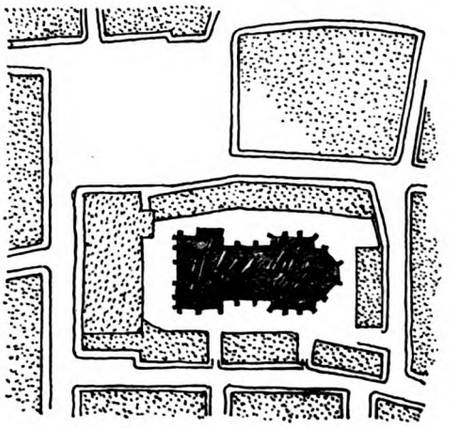


Fig. 5. Old Market, Stralsund.

The Duomo, was the square on or near which the house of God, the baptistery, the campanile and the bishop's palace were united. The church is seldom an independent structure, being usually connected on one or more sides with the cloisters, schools and similar buildings. The square with these buildings often constitutes the glory of the Mediæval city and may be compared with the Grecian temple-enclosure. The cathedral square of Pisa is a most beautiful example, and the dome, the baptistery, the clock-tower and the campo-santo speak in the monumental language of the marble.

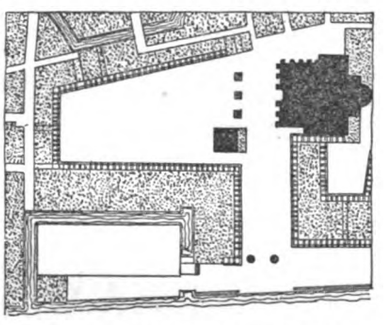


Fig. 6. Piazza of St. Mark's and the Piazzetta, Venice.

The Mercato was the market-place and with the Signoria has its prototype in antiquity. It was decorated frequently by a large well

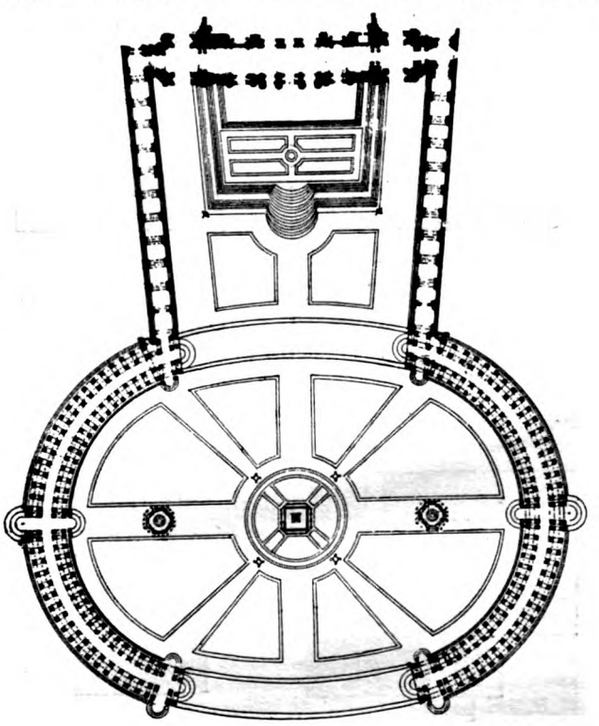


Fig. 7. The Piazza of St. Peter's.

in the centre, or by fountains, and contained the public scales. In Mediæval German cities the city-hall usually faced on the market-square; it was also customary to place the church in the background, and, although not in the square, a good view could be had of it over

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the low market-houses (Figs. 3, 4, 5). The minor religious buildings that at first surrounded these churches have since been removed and their sites now constitute some of the most beautiful church squares in Europe.

The Renaissance square has its prototype in the Roman forum. Particularly in Italy it was the custom to enclose the piazza in straight or in curved lines by arcades and colonnades, either free standing or connected with the buildings. The richest decorations consisted of obelisks, statues and fountains.

The Rococo period exhibits the highest development of the public square in modern times. The Piazza of St. Mark's (Fig. 6) with its rectilinear surroundings, and that of St. Peter's (Fig. 7) with its curvilinear colonnade give evidence of the high development to which the artistic treatment of the square was carried in this period.

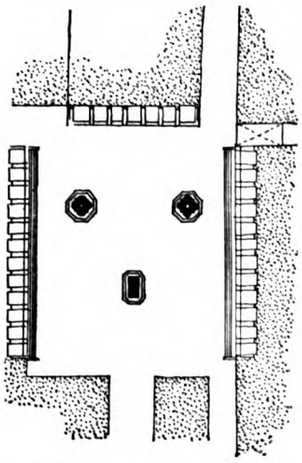


Fig. 8. Piazza dell' Annunziata, Florence.

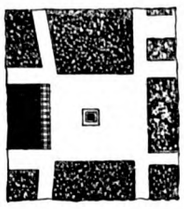


Fig. 9. Piazza Colonna, Rome.

Besides the open places entirely surrounded, some are found enclosed on three sides and open on the fourth; to these belong the Piazza Pitti and the Piazza dell' Annunziata (Fig. 8), Florence, the Piazza Colonna (Fig. 9) and the Campidoglio (Fig. 10), Rome. The last is particularly worthy of mention.

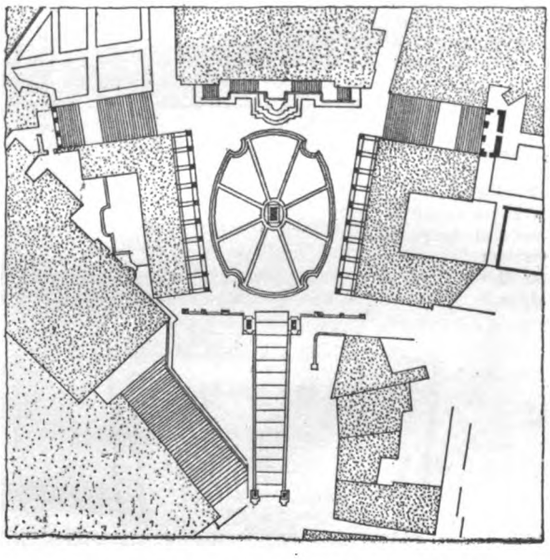


Fig. 10. Piazza del Campidoglio, Rome. $\frac{48m. \times 68m.}{2} \times 79m.$

The characteristics of the Italian square travelled north with the Renaissance, but especially with the later Renaissance and the Rococo. Their influence was felt in France and Germany as shown by such remarkable works as the Tuileries and the Place des Vosges, Paris, the Schlossplätze, Berlin, the Stanislaus Place at Nancy (Fig. 11). and the residence squares of the cities of Vienna, Versailles, Stuttgart, Carlsruhe, Coblentz and numerous fore-squares of public buildings. These fore-squares were surrounded by the building and its wings on three sides as shown in the Schlossplatze at Coblentz.

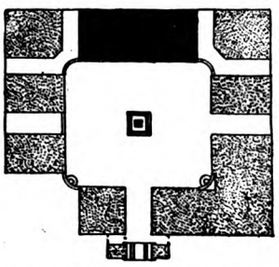


Fig. 11. Place Stanislaus, Nancy.



Fig. 12. Place d'Eylau, Paris.

The nineteenth century has produced but little artistic city planning, although there have been in the latter half of it more building activity and city enlargements than in any previous time. The work of surveyors and contractors too often takes the place of that of the artistic designer, and although they cannot be dispensed with, they should at least be directed by city officials who have been educated in the art of city planning. With us, size, rapidity of construction and dollars seem, in most cases, to have usurped the place of all artistic considerations.

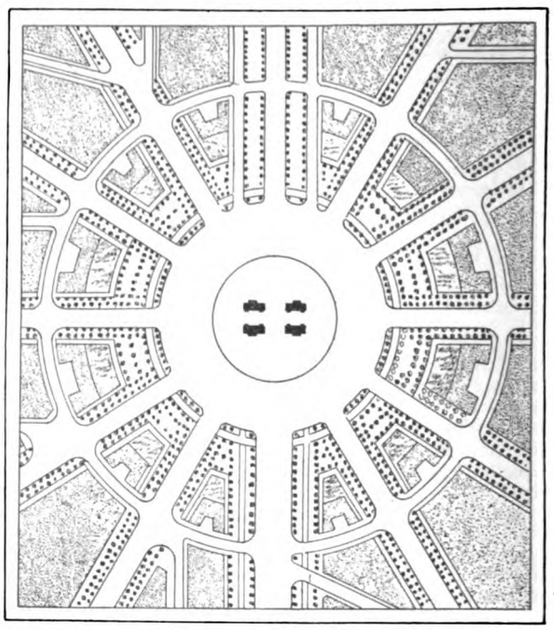


Fig. 13. Place de l'Etoile, Paris.

The Public Square and its Relation to the City Plan. — The public square with its architectural accessories is the most important means of decoration at the command of the designer of the city plan.

The position of the square in the city quarter, its place and its furnishing, depend upon the purpose for which it is to be used.

Public squares are classified with respect to their purposes, as traffic squares, market squares, garden squares and architectural squares. The same city square may serve two purposes, as seen in Figures 12 and 13, which are not only traffic squares but also architectural squares on account of the monumental character of the buildings surrounding them; or two squares, each serving its own purpose, may be combined, in which case they are called double or twin squares (Fig. 14). There are many so-called city squares which we shall not discuss as they are merely incidental to the street crossings and enlargements.

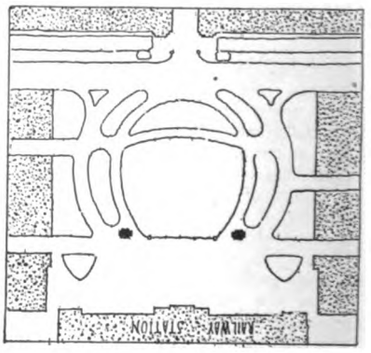
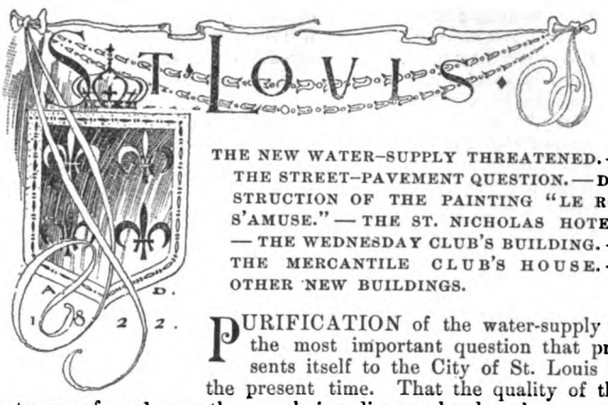


Fig. 14.

(To be continued.)

An Aerial Building for the Antwerp Exhibition. — One of the curiosities of the great exhibition to take place next year at Antwerp will be a literal castle in the air. We understand that a company has been formed to carry out the plan of M. Tobianski, an ingenious engineer, who has designed a sort of raft, having an area of about 180 square feet, and made of bamboo canes and steel and aluminium piping. Upon this is built a most luxuriously fitted-up restaurant. The raft is to be held floating in the air 500 feet above the ground, by a number of baloons; and an arrangement of anchoring by means of cables will, says M. Tobianski, prevent the restaurant from rocking even in the strongest wind. Two small captive baloons, each holding from eight to ten persons, will serve as lifts to keep up communication between the aerial restaurant and the earth. There is to be a regular system for supplying gas to the baloons, and at night the exhibition will be lit up by an immense electric-light projected from the raft. The whole thing can be lowered to the ground, by specially constructed windlasses, in about ten minutes. — *Invention.*

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THE NEW WATER-SUPPLY THREATENED. — THE STREET-PAVEMENT QUESTION. — DESTRUCTION OF THE PAINTING "LE ROI S'AMUSE." — THE ST. NICHOLAS HOTEL. — THE WEDNESDAY CLUB'S BUILDING. — THE MERCANTILE CLUB'S HOUSE. — OTHER NEW BUILDINGS.

PURIFICATION of the water-supply is the most important question that presents itself to the City of St. Louis at the present time. That the quality of the water now forced upon the people is a disgrace has long been recognized, and now that the new works on the Mississippi River at the Chain of Rocks are nearing completion, at an expense of over $6,000,000, the city authorities are beginning to recognize that they will be worthless from the fact that the Chicago drainage-canal is also nearing completion. To those not acquainted with the topography of the country surrounding St. Louis, we wish to explain that the Chicago drainage-canal empties into the Illinois River, which in turn empties into the Mississippi about sixty miles above St. Louis. The polluted waters of the canal will thus form part of the water-supply of St. Louis. An extensive sampling of water in both the Mississippi and Illinois Rivers is now being conducted under the supervision of the City Chemist and Board of Health Commissioners. A dangerous amount of nitrates and nitrites have been discovered in both these streams, especially at the mouth of the Illinois. Investigations have not progressed far enough to estimate the amount of filth which will undoubtedly pollute the city's water-supply, but the gigantic problem now presents itself as to just how effectually and how cheaply the water can be rendered fit for use. We will give the city authorities the credit of being most thorough in the investigations now in progress, but we blame them most unrelentingly for not having taken decisive action when the drainage-canal was begun. Now they might as well try to stem the tides of the ocean, as at the present writing the City of Chicago is actually delivering the pollution of that well-known Chicago River into the unfortunately swift but unsullied current of the Mississippi.

There are lively times in the City Council as far as street-improvement bills are concerned. The champions of asphalt, telford and granite pavements are making themselves heard in such loud tones that the Board of Public Improvements has decided that such scenes as those which recently took place at the City-hall shall not be repeated. Many bills for the reconstruction of various streets have been presented, and as there is "money" in them all, there has been a lively scramble for the contracts by the various companies. The latter have sent postal-cards to the owners of property fronting the streets proposed for reconstruction, asking them to exert their influence at the Board of Public Improvements meetings in favor of their respective pavements. Some owners have guided their actions according to these requests, while others have absolutely refused to agree to any kind of improvement. The latter are obstructionists, and the city in its plans does not consider them. The streets to be improved are mostly in the West End district, covering a large area, and the fight is to be waged between the upholders of the two light-traffic pavements, asphalt and telford. The latter pavement, as laid in St. Louis, consists of a course of rubble-stone overlaid with a course of macadam, and the latter topped with a heavy course of Meramec gravel. This is a good pavement if well maintained, but experience has proved that from lack of maintenance (arising more from the cost of same than anything else) it is nothing more than an excuse for macadam, and a costly one at that. The Board of Public Improvements is a unit in favor of asphalt, as its use for light traffic has been a great success in St. Louis. Property on asphalt-paved streets has doubled in value, which is not to be wondered at when it is considered that drivers will go out of their way to travel on this pavement. Asphalt is a little more costly than telford, but lasts many years longer. The cost of maintenance is less than in any other pavement, and the asphalt company itself assumes the expense of a few necessary repairs.

A well-known painting by Garnier, the French artist, was recently destroyed in the Laclede Building, this city. It was hung in the office of the late S. A. Coale, and on being placed in the freight-elevator for removal from the building was caught between the floor and elevator-car and torn to shreds. The handsome frame holding the canvas was broken to pieces. The picture was valued at $100,000, a rather absurd valuation. The picture, "Le Roi s'amuse," represented Pope Alexander Borgia, his sister Lucretia, and a number of cardinals near by, witnessing the dancing of a nude figure who held a waving scarf in her outstretched hands. It is a question whether the central figure of the group represents Alexander Borgia or Louis XIV, but the balance of opinion is in favor of the former. The picture was not owned by Mr. Coale but by a wealthy St. Louisan who does not wish to have his name known. It has been exhibited in all the countries of Europe, and reached the United States after banishment from England on account of the extreme nudity of the dancing figure. It is said that the picture can be made whole by a new process recently invented, but this is little satisfaction and little consolation to its unknown owner. Mr. Coale was a great admirer of the nude in art. The country, and St. Louis especially, has lost one of its most eminent art critics through his death.

St. Louis was not passed unnoticed at the recent New York Architectural League Competition, Mr. Harry G. Clymer carrying off the second prize, a silver medal, for his design of a church in the Colonial style of architecture. Mr. Clymer's drawing is now on exhibition at the New York Art Museum.

The St. Nicholas Hotel on Eighth and Locust Streets is fast nearing completion so far as the building itself is considered, and it is hoped that it will be ready to open by summer. Messrs. Adler & Sullivan and Ramsey, representing the Chicago firm of Adler & Sullivan, are the architects. The building is seven stories in height with a very high roof imbedded with very attractive tiling. So far as general details go it is quite a success, but there are minor points which in our opinion deserve criticism in so far as they are extreme to a degree. In the first place, the front of the building facing on Locust Street is graced with four bays running from the second to the sixth floor. The two of these nearer the corner of Eighth Street are divided by a couple of extremely diminutive windows to each of the four floors. They are not only very much out of proportion and very inappropriate but are not of the same size as the corresponding windows dividing the two western bays. In a description these might seem minor defects, but a glance at the building will quickly reveal them, on account of the general symmetry of details. If many-shaped turrets, oval, round, square, and diamond-shaped windows, numerous wings and variously sized and shaped doorways and arches were the rule, there would be a loop-hole for the architects. Then, the small windows are very suggestive of toilet-rooms. We hope they are not intended for such, because at no time should these be at the front of a hotel, even in connection with suites of apartments. A very pretty balcony extends along the seventh floor on Locust Street and along a part of same on Eighth Street. It is done in yellow terra-cotta in keeping with the yellow brick and terra-cotta of which the building is constructed. The seventh floor will be assigned to the main dining-room and a ball-room. The latter, it is said, will be a copy of Louis Sherry's in New York, but will outshine the former in extent and sumptuousness. It will be of white-and-gold, with spectators' boxes, and the floor will be of polished bird's-eye maple. The structure is entirely fireproof.

One of our great objections to the hotel as well as to the Union Trust Building on Olive Street is the extended use of terra-cotta, to the total exclusion of stone. Truly enough stone is used in the entrances to the hotel, but in the remainder of the building there is none to be seen. We agree with a well-known writer on architecture, that there is something very mechanical about terra-cotta: it presents no strict individuality of design, which is one of the real charms of true art, from the fact that we always think of it as being turned out "by the mile," so to speak. We do not wish to sneer at all terra-cotta work, however, as the above-mentioned writer would have us do, because we know of many efforts in this direction which are worthy of appreciation.

Plans are at present being prepared by Mr. W. Albert Swasey for a very handsome building to be used by the Wednesday Club, an organization of ladies belonging to most of the best families in St. Louis. It will be on Grand and Washington Avenues in the midst of the best residence section of the West End. It will be five stories in height, and cost in the neighborhood of $250,000. The style of architecture will be Grecian Ionic. The first two stories will be of marble imported from Carthage. The remainder of the building will be in buff Pompeiian brick with marble trimmings. The central portions of the two façades will be recessed for the third and fourth stories, large Grecian Ionic columns occupying the recesses and supporting the fifth story. The first floor of the building will be occupied by shops of a character most suitable to the needs of the locality, Turkish and plunge baths, gymnasium and reading-rooms. The second floor will be occupied exclusively by dentists' and physicians' offices. The Wednesday Club, a literary organization, will have on the third floor a lecture-room 50′ x 80′, and accommodating about four hundred people. There will be a small entertainment-hall on the same floor, to be used by dancing classes. The St. Louis Decorative Art Society will occupy the fourth floor, together with the music-rooms adjoining. A small theatre, to be decorated in the Empire style, will occupy the fifth floor, the other half being taken up by the Morning Choral Society's hall, and smoking and toilet rooms, foyer, dressing-rooms, etc. It is the intention to have the seats of the theatre removable, and thus it can be used for balls. In such cases the Choral Society's hall will be used for the supper-room, and will be connected by dumb-waiters with the caterers on the first floor. The club expects to derive its chief revenue from rentals for the shops. It is the intention to have no shop-wagons standing in front of the building at any time, the large court in the centre of the building opening onto the alley dividing Washington Avenue and Olive Street and enabling the wagons to reach the shops in the rear. The attic will be quite as commodious and well fitted up as the rest of the building: it will be divided up into rooms and lighted by skylights for the use of artists and photographers.

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The Mercantile Club has just finished its very attractive club-house on Sixth and Locust Streets. It is one of the most unpretentious but prettiest buildings in St. Louis. The style of architecture is French Renaissance with many modifications to suit the uses to which the building has been put. The central portion of the Locust-Street façade is five stories high with a very high pitch roof joining at right angles with the roofs of the two wings which face on Seventh Street and the alley respectively, and end on Locust Street. The latter are seven stories in height on account of the two extra stories in the roof. There is a very elaborate piece of carved stonework over the Locust-Street entrance, which has attracted much attention.

The Planters' House, fronting on Fourth, Pine and Chestnut Streets, is now receiving the finishing touches as far as the exterior of the building is concerned. When completed this will be the finest and largest hotel in St. Louis, and one of which her citizens may justly feel proud. It is ten stories in height and is in the shape of an E, the three branches running at right angles to Fourth Street, and thus the two courts facing that way. The main wing or backbone of the building runs along the alley connecting Pine and Chestnut Streets. The courts will be interrupted as far as the first story is concerned, the latter being unbroken from Pine Street to Chestnut Street. This was found necessary on account of the great need of the valuable space, which would otherwise be lost. The two roofs at these points are each surmounted by a covered promenade. The roofs of the latter are supported in part by four Roman Doric columns, the latter being connected by a very tasteful stone balustrade. There are two bays to the façade of each wing, and two each on the Pine Street and Chestnut Street sides, extending from the third to the tenth floor in all cases. The building is constructed of dark-buff brick, with Bedford-stone trimmings, and will be absolutely fireproof throughout.

The Collier estate is finishing a block of seven-story buildings, bounded by Fourth and Vine Streets and Washington Avenue. The architects are Shepley, Rutan & Coolidge, of Boston, Mass. The buildings are intended for retail business purposes, and the construction is on the slow-combustion plan. The first two stories are of iron and are recessed, large iron Corinthian columns occupying the recesses at suitable intervals, and supporting the upper stories of the structure. There are defects in the buildings, such as the entasis of the columns, which is painfully apparent. Then, on account of the two lower floors being recessed, the five remaining stories have the appearance of being on stilts, reminding one of the lake-dwellings in India and Japan. We will concede that there are remarkable show-window possibilities with such an arrangement, but this end is attained at the sacrifice of architectural beauty.

There is a large number of fine buildings now going up in St. Louis, several apartment-houses and hotels, other than those we have mentioned, as well as commercial structures, and a number of fine churches, in whose construction many original ideas have sprung up. All this activity tends to erase many old and ramshackle structures which were veritable fire-traps and a menace to their several districts.

THE EXCAVATIONS IN GREECE.

AN apparently well-informed correspondent sends the following communication to the New York *Tribune*:—

ATHENS, December 6.

Dr. Waldstein has two qualities which are useful as an archæologist: the enthusiasm which leads him to hunt diligently for something worth finding, and the enthusiasm which makes the most of that which he does find. When I saw him a few days ago he had just come from Argos where, under his superintendence, the American School has been digging for the last month. His face was radiant with that joy which illumines the face of a Western miner when he has struck a good lead, and he was ready to declare that the find this year was the richest that the American School has ever made. He even thought that it might compare favorably with the glorious results which in past days the Germans had achieved at Olympia. There is nothing like the wine of discovery for intoxicating the archæologist. In talking with Mrs. Schliemann the other day she spoke of the importance of imagination for the archæologist, especially in impelling exploration, but I venture to add that it is perhaps as useful in estimating the value of his discoveries. Certainly Dr. Schliemann owed his extraordinary success to a faith based on the glowing imagination which impelled him to use his spade where no archæologist had used it before; but how his imagination did flame over what he dug up! And well it might. Such personal exaltation is one of the privileges and compensations of the discoverer. Sooner or later a whole platoon of critics will clip the wings of his fancy and chill the halo round his head until it condences into perspiration on his brow. But he is a poor digger who when he first comes out of the trench, cannot convert these drops on his forehead into prismatic beads, glowing with all the colors of the rainbow. Doctor Waldstein is safe from the scalpel of the critics for at least several months to come, since his discoveries in the shape of some thirty-five baskets of pottery and various marble fragments are securely shut up in the National Museum, where no one can write them up but himself.

Two years ago, when the excavations were made by Dr. Waldstein at Eretria, a New-York weekly religious paper published a cable dispatch announcing the discovery of the tomb of Aristotle. The dispatch was preceded by an array of "scare heads" several files deep, and by a startling number of exclamation points, altogether too hysterical and ejaculatory for the sobriety of a religious paper, whose motto should be, "Swear not at all; let your yea be yea and your nay, nay." Dr. Waldstein was obliged to write, correcting the exaggerated statements sent to America by cable, and which three thousand miles of submersion under the ocean had not cooled off. And when I was at Eretria some time ago with the German School, I found that the German professors smiled rather incredulously when I spoke of the tomb of Aristotle. Their interpretation of the discovery, I suspect, would be much like the examination-paper of the boy who wrote, "Homer was not written by Homer, but by somebody else of the same name." Unfortunately, not having provided myself with a copy of that dispatch, and not being well fortified by Dr. Waldstein's argument, I could not convince Dr. Dörpfeld or Dr. Walters that Aristotle had a daughter or that the tradition should be disregarded which buried him at Chalchis instead of at Eretria.

The work of the American School at Argos this last year was in continuation of that done the year before when Dr. Waldstein had every reason to be jubilant over his finds at the Heræon. The time devoted to excavating was all too short, but the work was prosecuted with a large force and with great energy. Mr. C. L. Meeder, Mr. Richard Norton (a son of Professor Norton, of Cambridge), and Mr. Lithgow, all students of the American School were in the field, directing the large force of men and packing the finds. Mr. Washington has given the benefit of his large experience. A little scouting has been done at Sparto but with only negative results. On the other hand, bushel after bushel of pottery has been taken out at the Heræon and removed to Athens. I went to look at it last week, but could only see what lay upon the surface. Of the marble fragments there is an interesting female figure, a relief, forming part of the metope. It is very graceful, but the head and arms are unfortunately wanting. Two marble heads, one of them lacking the eyes and the brow, are tantalizing in their imperfection. Then there is a torso, representing a statute with a woman clinging to it. But the pottery, of which there is a vast amount, is the chief thing; and its value is that most of it is of work antedating the middle of the sixth century, B. C. There is a good deal of Mycene ware, also geometric work, Corinthian, black-figured and some red-figured ware, but the general absence of the latter has been rather remarkable.

While the locking up of the finds in the archaic rooms in the National Museum protects Dr. Waldstein from the annoyance which might come from exaggerated and sensational reports when the American School is not in session, adherence to the plan during the rest of the year is a matter which seriously cripples the usefulness of the School. The embarrassment grows out of the failure of the School to secure, as it was once thought might be done, Dr. Waldstein's whole time. His position at Cambridge, England, now engages him for the greater part of the working year. Courtesy and usage require that the discoverer should have the exclusive privileges of working-up and publishing the results of his finds. On the other hand, the Greek Government does not allow materials to be taken out of the country. Dr. Waldstein's enforced absence in Cambridge deprives the school not only of his presence, but the invaluable experience the students would have in working-up under his direction the material which, under the auspices and in the name of the School has been excavated. Thus the material discovered a year ago lies still in the museum, and the School has had no open session this year because it could not make bricks without straw. In the interest of the students some new arrangement should be effected. Either Professor Richardson, who is coming next year as permanent director, should have full charge of the excavations, or it should be understood that professors and students are to have the use for original study of the material which Dr. Waldstein in the service of the school has unearthed. I hope that before another year the committee will decide upon some plan which will not have the obvious defects of the present arrangement.

The French School continues work at Delphi with most encouraging results. It has a large job on its hands and is doing it with intelligence and energy. I hear that recent finds are of much interest. It will soon go to work on the temple terrace. On account of the diphtheria which invaded the School in the winter it has held scarcely any open sessions.

The German School, under Dr. Dörpfeld, pursued its excavations nearly all last winter in Athens in the vale which lies between the Pnyx and the Areopagus. The results have been of great interest. An old road has been found running nearly along the same course as the modern road which runs above it. The tracks of wagon-wheels may be seen just as they are seen at Pompeii. There are remains of dwelling-houses. But the most important discovery is an extensive and connected system of water-works which Dr. Dörpfeld believes is the Enneakrounos, constructed by Pisistratus. Certainly it is not difficult to find the nine pipes implied in the name. But the difficulty is that the situation is not where we should expect to find the Enneakrounos in relation to the spring of Kallirhoe, unless we assume, as Dr. Dörpfeld does, that that name was successively applied to two places. Further studies and excavations may be necessary to establish the identification, but, by whatever name it

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was called, this water-system is an example of the pains which the Greeks took and the expense they endured to get a full supply of good water for their cities. For purposes of comparison Dr. Dörpfeld, on his island trip, which it was my pleasure to join, visited the remains of the great water-works on the Island of Tamos, which Herodotus describes as one of the wonders of the world. Entering the narrow entrance on the hill-side near the town of Tigani, we soon found ourselves in a great tunnel eight feet high and eight feet wide, extending clear into the heart of the mountains, with a channel for the water on one side. Herodotus states that the tunnel was worked from both sides and that the sections met in the middle. It is of interest because it was made at the time Pisistratus made the aqueduct for Athens and it is quite possible that both were built by the same engineer.

Dr. Dörpfeld devoted much time last year to verifying his theory of the structure of the Greek theatre. His new book is nearly ready and may be expected to appear in print this winter. Briefly stated, his theory is that the origin of the theatre is found in the circular dance plat which gave rise to the circular orchestra, in which actors and chorus both appeared. The spectators' room, an amphitheatre with inclined seats, was afterward added. The stage, as its Greek name implies, was first a tent for the accommodation of the actors, afterward a permanent building. The proskenion was a series of columns with pictures between them, serving as a support for the scenery and screening the actors when they passed from the orchestra through a doorway in the middle. The proskenion was first a provisional and afterward a permanent structure. There was no stage whatever, and none was needed, for the spectators all commanded a full view of the orchestra below in which the performance was given, just as the actors in a modern circus are perfectly visible from the seats which surround it. Dr. Dörpfeld's theory is supported by the literary evidence which Höpken and Prof. J. W. White, of Harvard, have collected. They show from the nature of the Greek play that the chorus and actors could not have been separated by a stage twelve feet high, as Vitruvius says.

But the best proof of the tenability of Dr. Dörpfeld's theory is found in the theatres themselves. I have visited this year the theatres at Athens, the Piræus, Epidauros, Megalopolis, Argos, Thorikos, Eretria, Oropos and Delos, and in none of these, save Eretria, is there the slightest sign that anything in the shape of a stage ever existed. What at first sight appeared to be a stage at Eretria is seen to be the skene left so high, because as this theatre was constructed on a level plain, the orchestra was sunk deep into the ground. At Epidauros a chorus of German students was organized. It was remarkable how well one could hear high up in the last seat of a theatre accommodating 15,000 people. There was not the slightest difficulty in distinguishing chorus from actors, even when sitting down in the second seat above the orchestra.

The English School, though making experiments at another point mainly concentrated its field-work at Megalopolis, wisely preferring to do thorough work at one place than to scratch the surface here and there. With maps, drawings and photographs, Mr. Ernest Gardner, the director of the English School, showed at one of its sessions how much had been accomplished. I have since visited the excavations themselves where Mr. Loring and Mr. Benson have been directing the work. When the English began digging at Megalopolis there were traces of the great theatre, the largest in Greece, but the auditorium was overgrown with vegetation. An immense deal of labor has been necessary to remove the mass of earth, but the result has been of the greatest importance. It is surprising how soon, after a few successful excavations, the last Baedeker drops out of date. Thus Baedeker in 1889 says: "The Thersilion, or townhall (named after its founder), in which the 10,000 delegates from all Arcadia assembled, lay to the west of the theatre, but no remains of it are extant." This is no longer true. The whole foundation and a large part of this immense building, with many of its columns and ornaments, have been revealed. An idea of its size may be formed from its length, 510 feet. Other groups of buildings have been discovered and excavations have been carried on at both sides of the river which divided the town. It is interesting to note that a plan of the town and buildings drawn by Curtius from the descriptions of Pausanias was found to be remarkably correct, a new proof of the general accuracy of Pausanias and of Curtius's success in interpreting him.

It was the discovery, two years ago, of the steps of the Thersilion, directly opposite the theatre, which led Mr. Gardner to suppose that he had found the remains of a logeion, or stage, which, if true, would have been fatal to Dr. Dörpfeld's theory that in the classical Greek theatre no stage existed. Mr. Gardner's discovery was published somewhat too hastily as a refutation of the Dörpfeld view. But no sooner had Dr. Dörpfeld seen the plan of the excavation than he said: "I am sure, if you look carefully, you will find that what you suppose to be a stage is a stylobate, and you will probably see the marks of columns upon it." Dr. Dörpfeld had not seen the excavations when he made this suggestion; it was the fruit of his training and experience as an architect. Sure enough when the stones were examined the rings where the columns had stood were plainly visible. He also pointed out that the three lower of the five steps were of later construction than the upper ones. When the excavations were further continued it was found that what really had been discovered was the portico of the Thersilion. Mr. Schultz, the English architect, has since found the drums of many of the columns and portions of the entablature. In his lecture last winter Professor Gardner frankly admitted that what he had naturally supposed to be a stage had proved to be what Dr. Dörpfeld suspected. He withdrew entirely, therefore, his arguments based upon his first supposition. He advanced, however, the idea, that a wooden stage of some sort had been used. He based this new argument on the supposition that as the three lower steps are conceded to be later than the two upper ones, there must have been a blank wall before these steps were added, and this space was probably filled with a stage. Dr. Dörpfeld, on the other hand, maintained that the Thersilion was erected first — a large building with portico and two steps. Afterward the theatre in front of it was constructed. The circular orchestra was dropped say three feet lower into the ground, which compelled the addition of three steps, making five in all, so that one could descend from the portico into the orchestra. Great interest was manifested, therefore, in the visit of Dr. Dörpfeld and the members of the German School to the English excavations at Megalopolis. Mr. Gardner and his associate, Mr. Loring, who worked for the last two years at these excavations, laid great stress upon a supposed difference in tooling for determining the relative age of parts of the structure. Dr. Dörpfeld, on the other hand, maintained that the same tools were used through successive centuries, and are, in fact, used to-day; that, therefore, the date of workmanship could not be derived from it. When, however, we come to examine closely the steps and seats at Megalopolis, no real difference of tooling could be found. What Messrs. Gardner and Loring had supposed to be a difference of tooling was simply a difference of wear. Unfortunately, Mr. Gardner was not able to be present. Mr. Loring, however, made a reëxamination after Dr. Dörpfeld's visit, and was convinced that the English argument would have to be abandoned. He, therefore, declined to sign the report which Mr. Gardner and Mr. Schultz prepared. While he was not ready yet to accept Dörpfeld's theory as against the testimony of Vitruvius, that the Greek actors were on a stage and the chorus were below, he gave up the argument, so far as Megalopolis is concerned, and left Dr. Dörpfeld in possession of the field. The withdrawal of Mr. Loring greatly weakened the English case.

The disadvantage of premature publication appears in the use which Professor Jebb, naturally enough at the time, made of the supposed discovery at Megalopolis in his article "Theatrum" in Smith's "*Dictionary*." "By this example," said Professor Jebb, "the existence of a raised stage in the Greek theatre of the fourth century, B. C., is placed beyond doubt." But alas for human certainty! When we read that article it is necessary to be reminded that the assumption on which it was based has been wholly withdrawn.

SINCE the foregoing matter has been in type the following letter relating to it has been published in the New York *Evening Post*: —

"SIR: I wish to protest, through your columns, against the publication in the New York *Tribune* for December 31, 1893, of a letter from Greece, under the date, 'Athens, December 6.' To my certain knowledge, the letter was written last April, and all the statements it makes with regard to events happening 'last month,' 'a few days ago,' etc., are entirely false when published under the date given. Among other inaccuracies, the excavations at Argos made by the American School, under the personal supervision of Dr. Waldstein, are represented as taking place in November, when, as a matter of fact, they are carried on in March, and only in March, each year, that being the only time when Dr. Waldstein is in Greece.

"As a member of the American School for the year 1892-'93, I attended all the lectures and went on the expedition mentioned by the *Tribune's* correspondent, and of course know all about the work of the School for that year. There are certainly persons enough in New York interested in the School to make it important that any such detailed information about its work as is here given should be accurate as to time and season. MARY H. BUCKINGHAM."

BALTIMORE, January 9.

THE MOSQUE AT DAMASCUS RECENTLY BURNED.

CONCERNING the mosque that was burned a few weeks ago at Damascus, the Boston *Herald* publishes the following extended description:

"Damascus is famed for the number and beauty of its mosques, but the most celebrated is that known as the Great Mosque, which was formerly the Christian Church of St. John, which was recently destroyed by fire. It was the most important historical site in Damascus, and it is presumed to have originally been an open space, the centre of which was occupied by an altar dedicated to the idol god of the Syrians long previous to the time that Abraham travelled in this direction for the purpose of going 'into the land of Caanan.' Several hundred years later, when the Greeks and Romans were here, a heathen temple stood upon the spot, with altars and courts, colonnades and triumphal arches. After Christianity became the established religion of the Byzantine empire, the temple was converted into a church and dedicated to St. John the Baptist, and the Moslems of to-day have the belief that his head still remains in the cave where it is said to have been placed by the monks of that church.

"When, in the seventh century, Damascus fell into the hands of the Mohammedans, the church was occupied by Moslems and

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Christians alike, the former taking possession of the eastern part, while the Christians were allowed the use of the western part. But this division did not long continue on an amicable footing, for the Christians were not only expelled from their place of worship, but were forbidden to enter the inclosure of the sacred edifice, and from thenceforth the entire structure was transformed into the Mosque of St. John, which name it continued to bear down to the time of its destruction.

"In exterior appearance it was not so imposing at the present day as formerly, for it is now so closely hemmed in with bazaars and houses that its outside is almost entirely concealed from view. The church was in the form of a basilica, and the space between the inclosing walls of the quadrangle upon which it stood was about 500 feet long and 350 feet broad. It occupied nearly one-half of that space on the south side of the quadrangle, and but few changes were made in the interior plan since it was transformed into a mosque. The open court on the north occupied much the largest part of the quadrangle, and the ancient out-buildings in it were removed, and fountains and minarets erected in their place.

"It is said that the mosque would hold 30,000 persons, and its interior dimensions being 431 feet by 125 feet, and was divided into three aisles by two rows of columns, 20 in each row, which extended the whole length of the edifice. The columns were about twenty-four feet high, and most of them had Corinthian capitals. Along the north side of the mosque was another row of columns, which were encased in masonry, and the space between them was taken up by many windows and doors, through which access to the mosque was gained on that side. The triple roof rested upon two tiers of arches, supported by the rows of columns, and was said to be covered on the outside with lead. In the centre of the mosque and the transept of the ancient church there were four massive piers, above which rose a dome about 120 feet high and 100 feet in circumference. Colored glass was in the windows on the south side of the mosque and along the walls, and on some of the columns were extracts and texts from the Koran.

"Almost the whole of the marble floor was covered with prayer-carpets of different sizes and patterns, and on these the true believers performed their daily prayers. In the mosque were a number of striking objects. Looking eastward were the great dome-shaped frames, with their hundreds of lamps and the numerous chandeliers suspended by long chains from the arches and lofty roof. The minbar, or pulpit, and the mirab, or praying niches, in the south wall, with their slender marble columns, were quite attractive and suggestive. The most sacred spot in the edifice was the cave, above which was the shrine of St. John the Baptist. It was situated between the third and fourth column to the right of the dome, and near the south wall of the eastern part of the mosque. It was enclosed by a quadrangular wall built of fine courses of polished marble, upon which stood 20 square columns, 6 on each side and 4 at either end, counting the corner columns twice. The cornice was elaborately ornamented by extracts from the Koran in large letters, and above the shrine rose a ribbed dome resting upon an octagonal structure and surrounded by a gilded crescent. The height of the dome was about 25 feet.

"Including the colonnade on the east, north and west, the large open court enclosed by the walls of the mosque was about 450 feet long and 180 feet broad. The columns in the northern colonnade were encased in masonry and supported 24 horseshoe arches, upon which rested an upper tier of 50 smaller round arches. The sides of the masonry piers were ornamented with various patterns in panel work, and elaborate designs in rich arabesque adorned the capitals, while the arches were painted on the inside with alternate black-and-white irregular squares, presenting a striking and checkered appearance. The upper tier of arches was composed entirely of layers of black-and-white limestone, and the combined effect of these varied designs and different colors in the colonnade gave it an appearance eminently Oriental and attractive. More than half the number of Corinthian columns remained to view in the eastern and western colonnades, and the arches in the upper tier were supported by smaller columns of the same order of architecture.

"The Saracenic structure over the fountain in the middle of the court was quite imposing, with its eight columns and its many arches, and the domed pavilion above them was large and attractive. It was called 'the dome of the water-spout,' and its name was probably suggested by the constant and refreshing sound of the plashing waters from the numerous jets. Here, before entering the mosque, the faithful made their ablutions, and in the pavilion above this octagonal basin some of the religious ceremonies were conducted. In the eastern part of the court was situated 'the dome of the hour,' and a curious structure near the western end was called 'the dome of the treasure,' under which the sacred books and records of the mosque were deposited.

"There were three minarets to the mosque. The central one was known as 'the minaret of the bride,' and the gallery where the muezzin proclaimed 'the call to prayers' was reached by a spiral stairway of 160 steps. This was the eldest of the three, and was built up square, with four galleries. The western minaret on the southwest side of the court was the most beautiful, being octagonal, built in receding sections, like a telescope, with three galleries. The loftiest of the minarets was the minaret of Jesus, so-called from a Moslem tradition, that on the morning of the judgment-day Jesus will descend from heaven upon it and sit in judgment upon all the nations of the earth. This minaret was built upon a square tower, octagonal in shape, tapering to a point and surmounted, as were the other two, by a crescent. There were two covered galleries in the tower, and two open ones on the spire of the minaret.

"The style and workmanship of three periods were to be distinguished in the building. There were the massive foundations and exterior colonnades of a Greek or Roman temple. There are, next, the round-topped windows and ornamented doorway of the early Christian church. Over the door was an inscription in Greek to the following effect: 'Thy kingdom, O Christ, is an everlasting kingdom, and thy dominion endureth throughout all generations.' Then come the minarets, dome and arcades of the Saracenic origin.

"There is no doubt that the destruction of property in connection with the mosque was very great, but it cannot be possible that an edifice built entirely of stone, and of massive masonry, is wiped entirely out of existence."

RUSTLESS COATING FOR IRON.

THE following is a translation by Mr. Frederic W. North of a paper read before the Paris Société d'Encouragement by M. Octave de Rochefort-Lucay, on the new Bertrand processes for coating with magnetic-oxide and enamelling iron and iron-carburets, and on a new process of tinning for cast-iron: —

Messrs. Barff and Bower were the first to practically coat iron, steel and cast-iron with magnetic-oxide, so as to form, at the cost of the metal itself, the protective layer that is obtained usually from paint, or from enamelling, etc., with a thin coating of a metal that is not oxidizable.

The Bertrand processes are more simple than those of Bower and Barff, and are based on a new discovery in chemistry, and may be stated thus: — If a thin adherent film of another metal is formed on the wrought-iron or on the cast-iron, and this iron or cast-iron, heated to 1,000°, is exposed to a current of oxidizing-gas, the oxygen penetrates through the film, oxidizes the iron or the cast-iron, and under these conditions, magnetic-oxide is the result. The formation of magnetic-oxide, thus obtained, continues indefinitely, and the thickness of the coating of oxide increases according to the period of exposure to the oxidizing current, providing the temperature remains at about 1,000°.

As to the film of metal deposited in the first instance, it disappears in some obscure way, forming oxides which mingle with the magnetic-oxide or volatize according to the nature of the metal of which they are composed. M. Bertrand had then to find the best metal and the best method for depositing it on the article to be coated, and he has found that bronze, a mixture of copper and tin, gives from a practical point of view every satisfaction. For depositing this bronze on the wrought-iron and cast-iron, M. Bertrand uses electricity or wet-baths, and uses sulphophenolic acid.

The following is the method adopted in the Bertrand manufactory for an oxidation: — The article is cleansed (the cleansing is not indispensable), then dipped a few moments in a bath containing a solution of sulphophenate of copper and tin. The coating of bronze being formed, the article is immediately washed with cold water and dried with sawdust. The article dried is put into a furnace. Oxide forms, and at the end of fifteen to thirty minutes (according to the articles) the article is taken out, sufficiently oxidized. The coating produced varies from $\frac{1}{10}$ to $\frac{1}{5}$ of a millimetre.

M. Bertrand uses electricity to ascertain if the coating is of sufficient and uniform thickness, and in doing so he makes use of bells. If in putting the two wires in contact with the oxidized article the bells ring, the current passes — the oxidation is insufficient; if it remains silent, the oxide formed is of sufficient practical thickness because it prevents the electric current from passing.

Process for Tinning Cast-iron. — M. Bertrand has also used sulphophenolic acid to obtain tinning on iron. He dissolves salts of tin in a mixture of water and sulphophenolic acid at the rate of one per cent of tin salt, and five per cent of sulphophenolic acid. In this mixture the article, which is previously cleaned, is dipped; and is at once covered with an adherent coating of tin, and afterwards by the means of rotating brushes in wire and cloth, the coating of tin is polished, and a result obtained which is both effective and cheap.

Process for Enamelling. — There are not more than two processes for enamelling cast-iron. In the first, called hot, the iron, heated to a vivid red, is powdered with a flux-powder (borosilicate of lead), distributed with a sieve, then it is heated, and when the flux fuses, it is powdered afresh with glass more soluble, forming the glaze of the enamel. This process, the only direct enamelling, is dangerous to the operator, and even impossible for large articles, nor does it allow of decorations. The second process consists of dressing the cast-iron either by three distinct and successive operations in the furnace with a kind of pottery. In the Bertrand enamelling, the article is first coated with magnetic-oxide, then dipped in borosilicates of lead, colored by metallic-oxides, in which is added a little pipe-clay in order to give rather more body. The article thus covered cold, by dipping or with brushes, is put into the furnace; the enamel adheres and vitrifies at the usual furnace temperatures used by enamellers. By putting a coating of colored enamel with a brush on a first coat simply plain, it is possible to make any decorations desired, which

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may be burnt in at one operation for out-door vases, etc. These results, due to the first oxidation with magnetic-oxide, are remarkable, as much for the color as for the tenacity of the enamel and its resistance to rough usage. — *Journal of the Society of Arts.*

SOCIETIES

THE ARCHITECTURAL LEAGUE OF NEW YORK: COMPETITION FOR THE PRESIDENT'S MEDAL.

THE bronze medal, given yearly by the President of the Architectural League, will be awarded at the next annual meeting, March, 1894, to the best design for a Cover for the Catalogue of the coming annual exhibition, to be held in the month of December of this year. This prize is to be restricted to the members of the League.

Requirements. — A drawing full-size for a cover 6″ x 9½″, the sheet not to show more than four inches of margin. The design to be rendered in monotone, and the color of the paper indicated. If the drawing trespasses literally upon anything extant, the source of the design is to be referred to. The best three designs will be selected by the committee, for the League at large to vote upon, and of these three, the one receiving the largest vote will be awarded the prize. Send drawings, express prepaid, to the rooms of the Architectural League, 215 West Fifty-seventh Street, on or before March 2.

EDWARD H. KENDALL.
JOHN DUFAIS.
FRANCIS C. JONES.
E. K. ROSSITER.
GEORGE L. HEINS, *Chairman.*

WORCESTER ART STUDENTS' CLUB.

AT the annual meeting of the Art Students' Club, held January 27, the following officers were elected for the ensuing year:

Eben Harrington, *President;* Eugene A. O'Connor, *Treasurer;* Edward Topanelian, *Secretary;* Frances A. Knowlton, *Librarian;* Eben Harrington, Eugene A. O'Connor, Jennie Lea Southwick, Frank J. Darrah, Anna Ballard, Geo. E. Gladrim and Edith L. Getchell, *Trustees.* The reports showed the club to be in a prosperous condition. Sketch classes are maintained throughout the winter, monthly exhibitions are held, and several papers have been read during the past year and discussed at its meetings. A paper on "English Cathedrals," illustrated with stereopticon views, is to be delivered at an early date by Stephen C. Earle, Architect.

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

HOUSES ON COMMONWEALTH AVE., BOSTON, MASS. MESSRS. PEABODY & STEARNS, BOSTON, MASS. AND MESSRS. MCKIM, MEAD & WHITE, NEW YORK, N. Y., ARCHITECTS.

[Gelatine Print, issued with the International and Imperial Editions only.]

CALVARY PRESBYTERIAN CHURCH, WEST NEW BRIGHTON, STATEN ISLAND. MESSRS. STEPHENSON & GREENE, ARCHITECTS, NEW YORK, N. Y.

THE new building, which is nearing completion, is on the corner of Castleton and Bement Avenues. The plot on which it stands slopes away very rapidly from the front and thus allows of a high basement, which at the rear is entirely above ground. The walls up to the window-sills, and the tower up to the belfry, are built of overburned or "bench" brick laid up in brown mortar, and trimmed with Newark brownstone. The upper part of the building is of wood covered with plaster slabs and cemented with Portland cement. The half-timber work is of Georgia hard-pine stained a warm brown. The roof is covered with shingles stained a tile-red. The principal floor has two entrances from Castleton Avenue, one through the tower and the other through a framed timber porch and a double vestibule. Both lead to the auditorium which is 67 feet long and 72 feet wide across the transepts and will accommodate 450 persons, 340 in the pews and 110 in chairs in the east transept which is intended for children from an orphan home. This transept has sideways-rolling partitions so that it can be shut off from the auditorium and used for small meetings during the week. It has a large fireplace built of Pompeiian brick. The roof of the auditorium is cruciform, and is carried by heavy Georgia pine trusses worked with curved braces and octagonal tie-beams, and placed where dotted lines are shown on plan. The roof is exposed on the interior all the way up to the ridge, and is ceiled-up on the slope with narrow boarding of North Carolina pine. The pulpit-platform is in a recess under a high and wide arch of richly-moulded plaster resting on clustered wooden columns with carved capitals. The platform has a high panelled wainscoting, and above the wainscoting at the back are three windows glazed with dark, rich-colored glass. The organ is at one side, and the arch to the auditorium and the platform are to be filled with gilded pipes. At the pulpit end of the church are two staircases, leading to halls and entrances in the basement. There is also another staircase to the basement at the other end of the building. The front end of the basement, near the tower, is divided up into two toilet-rooms and the kitchen, and the boiler and coal rooms. The remainder of the basement is taken up by the Sunday-school rooms. Two class-rooms and the infant class-room, under the large transept, can be shut off by rolling partitions. The Sunday-school library is near one of the entrances. There are two large entrances, one with a framed timber porch, as shown in the sketch of exterior. The building is heated with steam, partly by the "indirect" method, and is ventilated by drawing the air off under the floor and passing it off through a large ventilating-shaft.

COMPETITIVE DESIGN FOR STATE-HOUSE AT OLYMPIA, WASHINGTON. MESSRS. WM. COWE & G. F. HARVEY, ARCHITECTS, DENVER, COL.

HOUSE FOR JUDGE SCOTT, PATERSON, N. J. MR. CHARLES EDWARDS, ARCHITECT, PATERSON, N. J.

DESIGN FOR A HOUSE AT HARTFORD, CONN. MESSRS. HAPGOOD & HAPGOOD, ARCHITECTS, HARTFORD, CONN.

CHAPEL FOR ST. JOHN'S MILITARY ACADEMY, DELAFIELD, WIS. MR. JOHN A. MOLLER, ARCHITECT, MILWAUKEE, WIS.

PUBLIC SCHOOL BUILDING, CHARLOTTESVILLE, VA. MESSRS. CARPENTER & PEEBLES, ARCHITECTS, NORFOLK, VA.

[Additional Illustrations in the International Edition.]

THE NEW YORK STATE BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

PORTE COCHÈRE OF THE HÔTEL OF THE DUC DE BETHUNE SULLY, RUE DE VARENNES, PARIS, FRANCE.

[Gelatine Print.]

"CRAGSIDE," NORTHUMBERLAND, ENG.: THE DRAWING-ROOM. MR. R. NORMAN SHAW, ARCHITECT.

"CRAGSIDE," NORTHUMBERLAND, ENG.: DETAIL ANGLE OF HOUSE. MR. R. NORMAN SHAW, ARCHITECT.

NOTES AND CLIPPINGS

THE DRIVEN-WELL LITIGATION. — In an interesting article entitled "A Tragedy of Litigation," the Boston *Transcript* tells the story in its entirety of Col. Nelson W. Green and his driven-well, the recent dismissal in the United States Court at Boston of two or three old suits affecting the patent (which was finally declared invalid in 1887) making the recital timely. Col. Green (a native of Amherst, Mass.), while in command of a camp of the Seventh (New York) Regiment at Cortland in the summer of 1861, sank a hollow tube in the earth in order to obtain a supply of clear water for his men. The idea was a novelty, and it was so quickly taken up and used that driven-wells soon became common enough. Col. Green was preparing to apply for a patent on his invention when, during an altercation, he shot and severely wounded an officer of his command, Capt. McNett. The colonel was dismissed from the service, indicted in the Criminal Court, and finally tried in 1866, the jury disagreeing. Everything seemed to go against him during this period of his life. Although known to be a brave officer, his efforts to secure a reversal of the order, dismissing him from the service, were futile; he was expelled from his church, and, to add to his difficulties, he was harassed by civil suits growing out of orders for supplies furnished to his regiment. So that it was not until 1865 that he took out a patent on his invention. Then began a protracted and vexatious series of contests in the courts. Driven-wells were in use everywhere, and none of the beneficiaries of the invention valued it more highly than the Western railroad companies, which, if the suits went against them, must pay Col. Green fabulous sums in damages. Their main contention was that the driven-well was merely a hole in the ground, but Green finally triumphed, the United States Supreme Court deciding that his device was original and patentable. At the very moment, however, when he was about to become a veritable Crœsus, all his hopes were dashed. The litigation came up once more in a new form, it being urged in a suit of apparent insignificance that the patent was invalid, because the invention which it covered had been in public use for more than two years before the patent was applied for. So the court decided. All that Green gained was the barren satisfaction of having it proclaimed to the world that he was indisputably the inventor of the driven-well. — *N. Y. Evening Post.*

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Has not one Man as much Right to his Name as another? — According to the European edition of the *Herald* a trial of great interest to painters and other artists is shortly to come before the Paris police-courts. It appears that M. Alfred Stevens, the well-known artist, received a few weeks ago the catalogue of an art sale which was to come off at the Hôtel Drouot. M. Stevens received the catalogue of a well-known expert, who was himself to conduct the sale. In this catalogue M. Alfred Stevens found a picture entitled "Le Collier" attributed to him. As he had never painted a picture with this title, he went to the Hôtel Drouot and asked to see the picture. A daub, signed "A. Stevens," was shown him. At the back of the picture was written: "I certify that this picture was painted by me. (Signed) A. Stevens." An inquiry was made, and it was found that the painter of the picture was a man named Agapit Stevens, who signed his pictures without putting his name in full. The mistake in the catalogue was rectified, and the picture was sold at a much lower price than it otherwise would have been. Now the real Alfred Stevens intends to prosecute his namesake before the law courts. It will be interesting to see how justice will settle this delicate point. Agapit Stevens certainly has a right to his own name, but in view of the fact that the signature of Alfred Stevens, abbreviated, has become a valuable trademark, it would seem that unless Agapit Stevens signs his productions in full he must lie under suspicion of practising an imposition. I once knew in Paris a fellow who made his living by signing pictures for dealers of a certain class. He called himself a "signaturist," and was a master of his trade. He was a painter of no merit, but he had a knack of imitating signatures, and he had also a very good eye for the styles of different artists, dead and alive. There was something quite comic in the way in which he executed his rascalities. He made pretense of discovering signatures. For instance, some junk-man in art got hold of a lot of canvasses. If they were unsigned, well and good. If they were signed with names of no selling value, these could be taken off or painted over. Then the signaturist's turn came. The dealer would send for him. "I have just bought some pictures," the dealer would say, "and I do not know by whom they were painted. Be so good as to examine them." The signaturist would commence: "Eh, eh! A Rembrandt, eh? or possibly a Bol. We must see. An excellent Corot, a little weak, but of the good style. What a fine Delacroix! My friend, you have good fortune," and so on. The pictures would end by going to his room, so that he might seek for the signatures more effectively than he could in the shop, and he never failed to find a signature. He had books full of fac-similes of signatures of all sorts which he had copied or traced from pictures and prints, or cut from various publications, and he could always find one to fit. He charged a fee, always small, but proportioned to the importance of the names he used, and he made so little secret of his knavish trade that I have heard him remark of a picture in a window: "Eh, eh! one of my Diaz's. What a family I stand godfather to." — *The Collector.*

The Zone Tariff in Hungary. — The Board of the Hungarian State Railways has compiled some interesting comparative statistics about the passenger traffic of Hungary and some of the large foreign railways during the years 1888 and 1891, or from the year the zone traffic was introduced in Hungary. The following table shows the increase in the passenger traffic during those four years on the following railways:

	Passenger Traffic. Per cent.	Receipts. Per cent.
State Railways of Saxony	14.4	7.5
" " " Baden	13.5	7.4
" " " Prussia	34.4	11.6
" " " Wurtemberg	20.9	8.8
" " " Bavaria	17.1	6.9
" " " Austria	34.6	11.8
" " " Hungary	168.1	24.0

During 1892 the increase, as far as Hungary is concerned, rose to respectively 191.8 and 28.9 per cent, and would no doubt have risen still higher had not the cholera considerably interfered with the traffic, which also suffered extensively through snow in the winter. The Hungarian State Railways do not, however, mean to rest on their laurels, but are preparing another new measure, thanks to the initiative of M. Lukacs, Minister of the Interior. This new departure consists in the introduction of railway stamps, whereby the trouble of taking tickets will be avoided. Every passenger fills out a printed form, stating from what station he comes and to which he intends to go, and a sufficient number of marks are affixed to the form on the space reserved for the stamps. The forms will be sold at every tobacco-shop for a nominal charge, as will the stamps, representing values from 25 to 75 kreutzer and 1 to 5 gulden. Before commencing a journey the passenger refers to a small book, which is also found in the shop, in order to ascertain in which zone the place of his destination lies, and as the whole of Hungary is divided in fourteen zones, it is not a difficult task. The control with these new "tickets" will also be very simple; the stamps are perforated across the middle, the one end is affixed to the form, and the other the ticket-collector tears off when the passenger enters the train, the form, with the remaining half or halves, being given up on leaving the train. This arrangement came into force on January 1. — *Engineering.*

Sewage Disposal at Worcester. — The municipal authorities of Worcester, Mass., were compelled by law, a few years ago, to adopt measures for purifying the sewage discharged from the city into the Blackstone River, owing to the complaints of towns a little further down stream, and the largest works for this purpose in the United States have now been constructed there. Recent enlargements of the plant draw attention to it. Sixteen immense tanks, or vats, have been built by filling in a marsh with sand and gravel, erecting division walls, and coating the bottoms and sides with cement. The sewage is conducted into the first two or three of the tanks, where slaked lime and certain iron salts are added, and then flows out through other tanks, where the heavier portions are precipitated. The more liquid part flows off through a big pipe into the river, in an innocuous condition, and in its descent the effluent water drives a turbine, which in turn compresses air for the operation of a pump. This last mechanism then takes the sediment, or "sludge," which has drained into channels along the inclined bottoms of the precipitating-tanks, and forces it out into "sludge fields," where it dries, and is sought by farmers for fertilizing the soil. The salts of iron are supplied in the sewage itself by certain manufacturing establishments in the city, and make their appearance at certain regular intervals. Separate tanks are reserved for the liquid so affected, which is subsequently mingled with the contents of the other tanks. Hence it is necessary for the city to supply only lime to promote precipitation. The superintendent of these works takes hourly samples of the crude sewage received, and of the effluent water, and also of the river water, for chemical analysis. Curiously enough, the river was apparently more filthy just below the city during the latter part of 1893 than when only one-fifth (instead of the whole) of the sewage was chemically treated. It is explained however, that there has been an immense deposit of slime along the river bottom in the past, and now this is being washed up by the flowing water, which before could not hold it in suspension. After a time, however, the precipitated matter will all be swept away, and the character of the water will be perceptibly improved. — *N. Y. Tribune.*

The Difficulty of Moving a Library. — As the new Public Library Building in Copley Square, Boston, nears completion, the question of how the 700,000 volumes composing the library shall be moved from the old structure to the new one becomes a most perplexing one. When the removal is made the library will have to be closed, perhaps for two months. Moving a library is not an every-day affair, and there are hardly any precedents, not even one really practicable precedent to go by. The nearest in respect of size was the moving of the great royal library at Berlin a good many years ago. That library contained 800,000 volumes, and was moved in twenty-four hours by a regiment of soldiers, who carried the books, shelf by shelf, to the new building, marching in files, keeping step to music by the regimental band, all with military precision. In the Boston case the books will be dusted, put into boxes the size of the shelves, eight to ten feet long on the average, and all properly labeled, so as to avoid confusion. Then they are to be transported to the new building, unloaded and put on the shelves in exactly the same corresponding positions, otherwise the library would have to be re-catalogued. This would be practically an impossible task, and would be too costly besides. The Harvard Library, containing about half as many volumes as the Boston Public Library, began to re-catalogue its books in 1861, and the work was finished only about five years ago. That is to say, re-cataloguing the Boston Public Library would take about fifty years. — *The Collector.*

Deaths from Gas. — It is high time that the theory that people who are found dead in their bedrooms, suffocated by escaping illuminating-gas, have blown out the gas should be looked into by coroners' juries before it is accepted as sufficient evidence of an intentional death. In most cases these deaths occur in hotels. There is a strong probability that, being amid strange surroundings, the victims leave the gas burning low, a very dangerous thing to do, and that the varying pressure from the gas-mains first puts out the feeble flame and then fills the room with gas. Frequently, too, the stop-cocks get so loose that the strong pressure in the mains after midnight, when most of the consumption ceases, is sufficient to force the cock and permit the gas to fill the room. A person accustomed to electric-lights will sometimes, in a fit of absent-mindedness, turn on the gas without lighting it, a misapplication of habit, which is soon discovered. Occasionally a person accustomed to blowing-out oil-lamps may, by force of habit, blow out the gas with more fatal consequences, although the odor of escaping gas is so disagreeable that it would seem as if the mistake in nearly all cases should be discovered promptly. But that the country is so full of people who blow out the gas that some of them kill themselves every day is entirely impossible. — *Philadelphia Inquirer.*

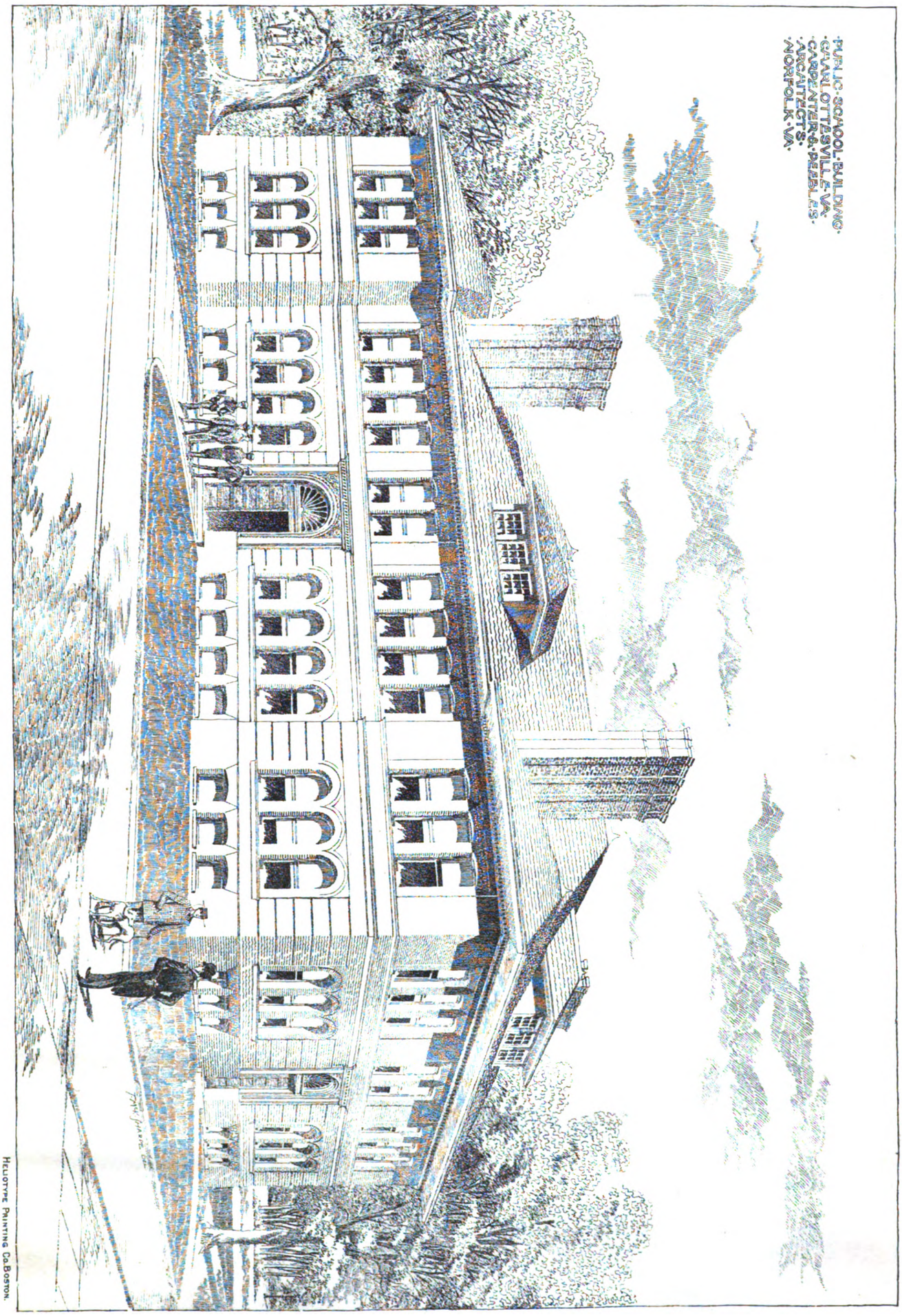
Siemens and an Arab on the Great Pyramid. — An amusing account is given in the recently published papers of Werner von Siemens of a scientific investigation carried out on the top of the Great Pyramid by the professor and a party of friends. Experiments were made to test the electrification of the atmosphere during the blowing of the "chamsins," and after watching the proceedings for some time, "the Arabs," says the narrative, "came to the conclusion that we were engaged in sorcery, and requested us to leave the pyramid." As their remarks when interpreted produced no effect, they attempted to effect an ejection by violence. "I withdrew to the highest point," the narration proceeds, "and fully charged my strengthened flask, when the Arab leader caught hold of my hand and tried to drag me away from the position I had attained. At this critical moment I approached the top of my flask to within striking distance of the top of his nose, which might be about ten mm. The action of the discharge exceeded my utmost expectation. The son of the desert, whose nerves had never before received such a shock, fell on the ground as though struck by lightning, rushed away with a loud howl, and vanished with a great spring from our vicinity, followed by the whole of his comrades. — *Invention.*

Why England is Beautiful. — As I strolled across the moor this afternoon toward Waverley, I saw Jones was planting-out that bare hillside of his with Douglas pines and Scotch firs, and new strains of silver birches. They will improve the landscape. And I thought as I scanned them, "How curious that most people entirely overlook this constant betterment and beautifying of England! You hear them talk much of the way bricks and mortar are invading the country; you never hear anything of this slow and silent process of planting and developing which has made England into the prettiest and one of the most beautiful countries in Europe." — *Grant Allen in The Westminster Budget.*

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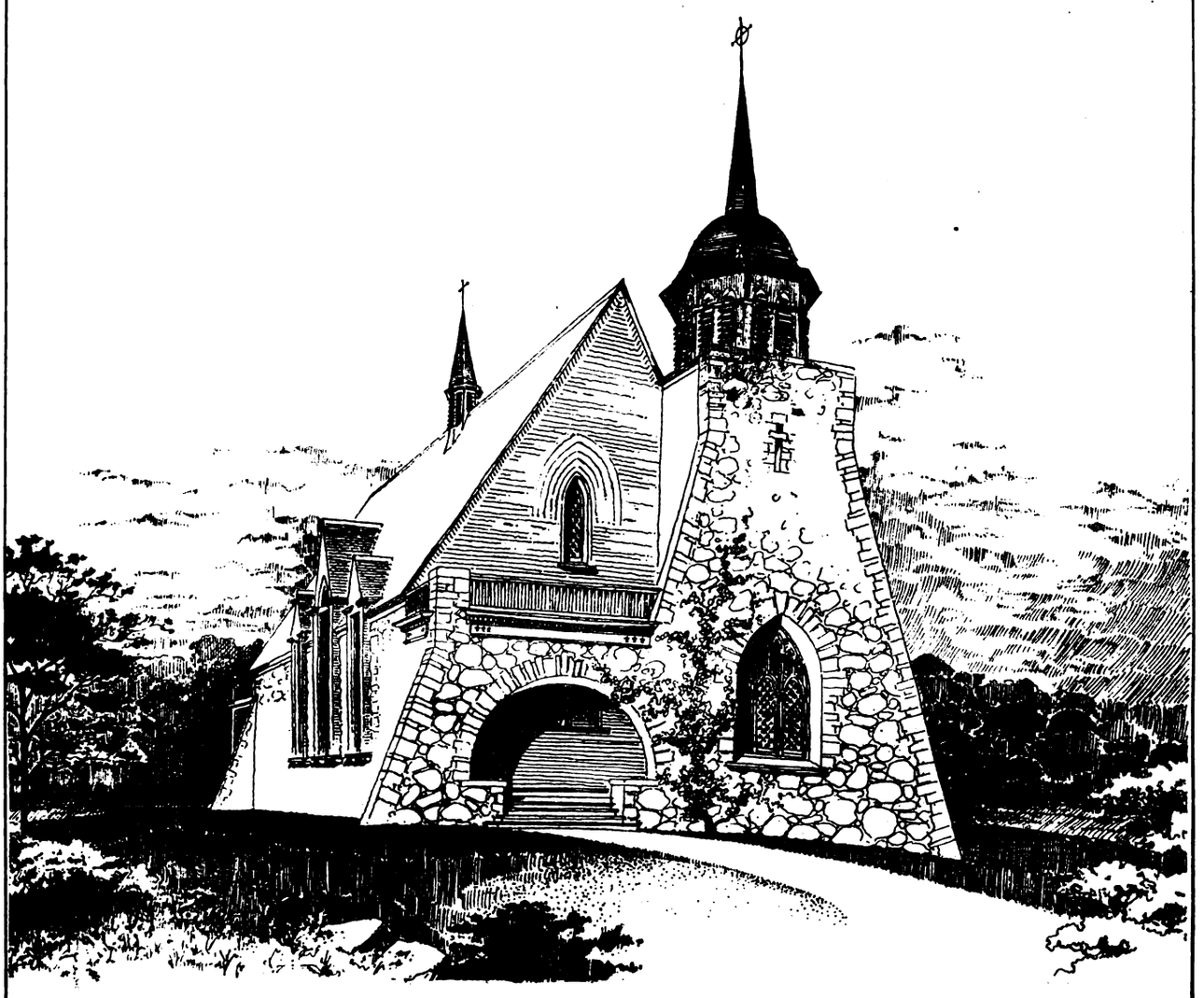
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CHAPEL for St. Johns Military Academy.

DELAFIELD WIS.
JOHN A. MOLLER ARCHITECT MILWAUKEE WIS.



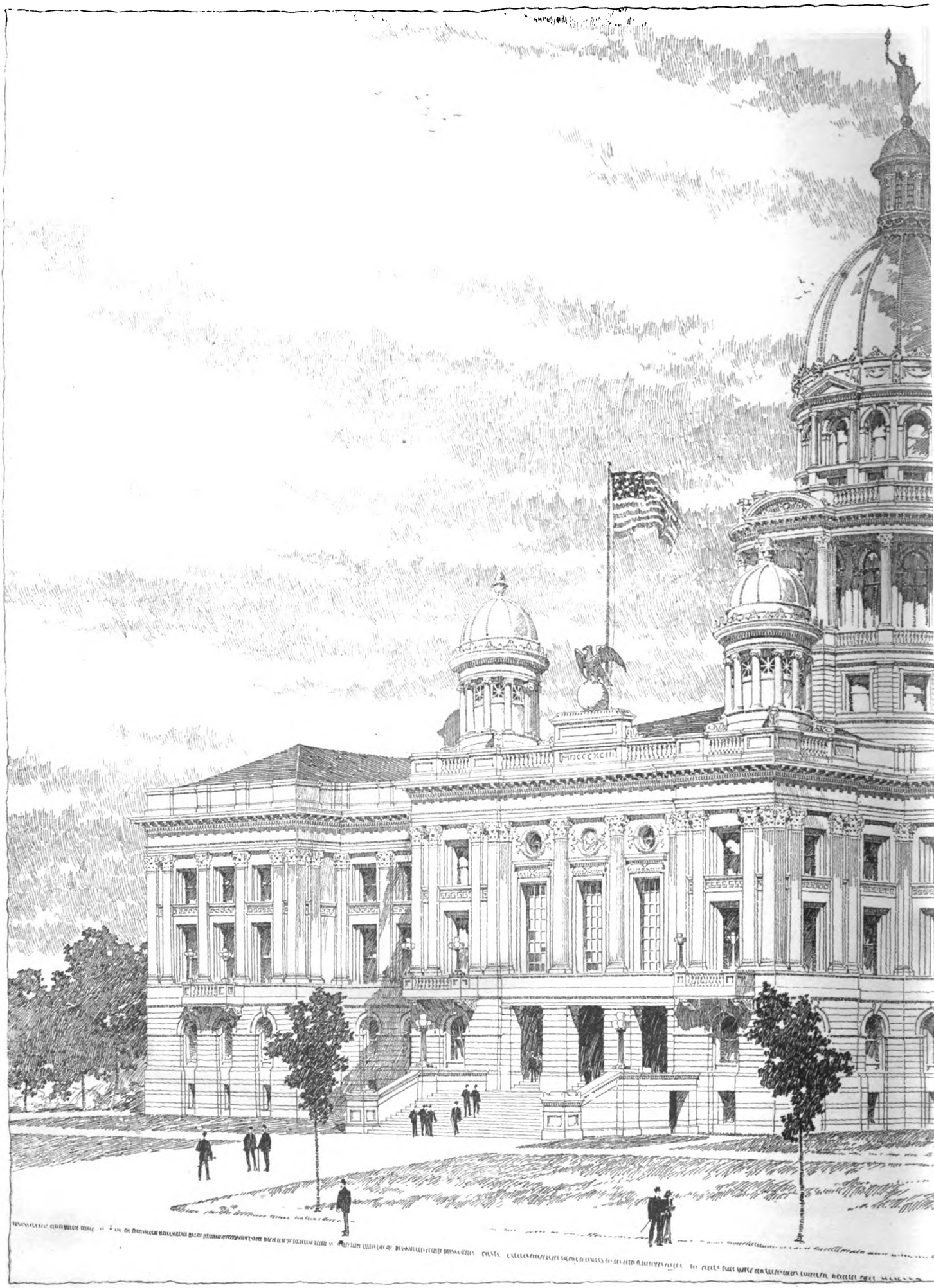
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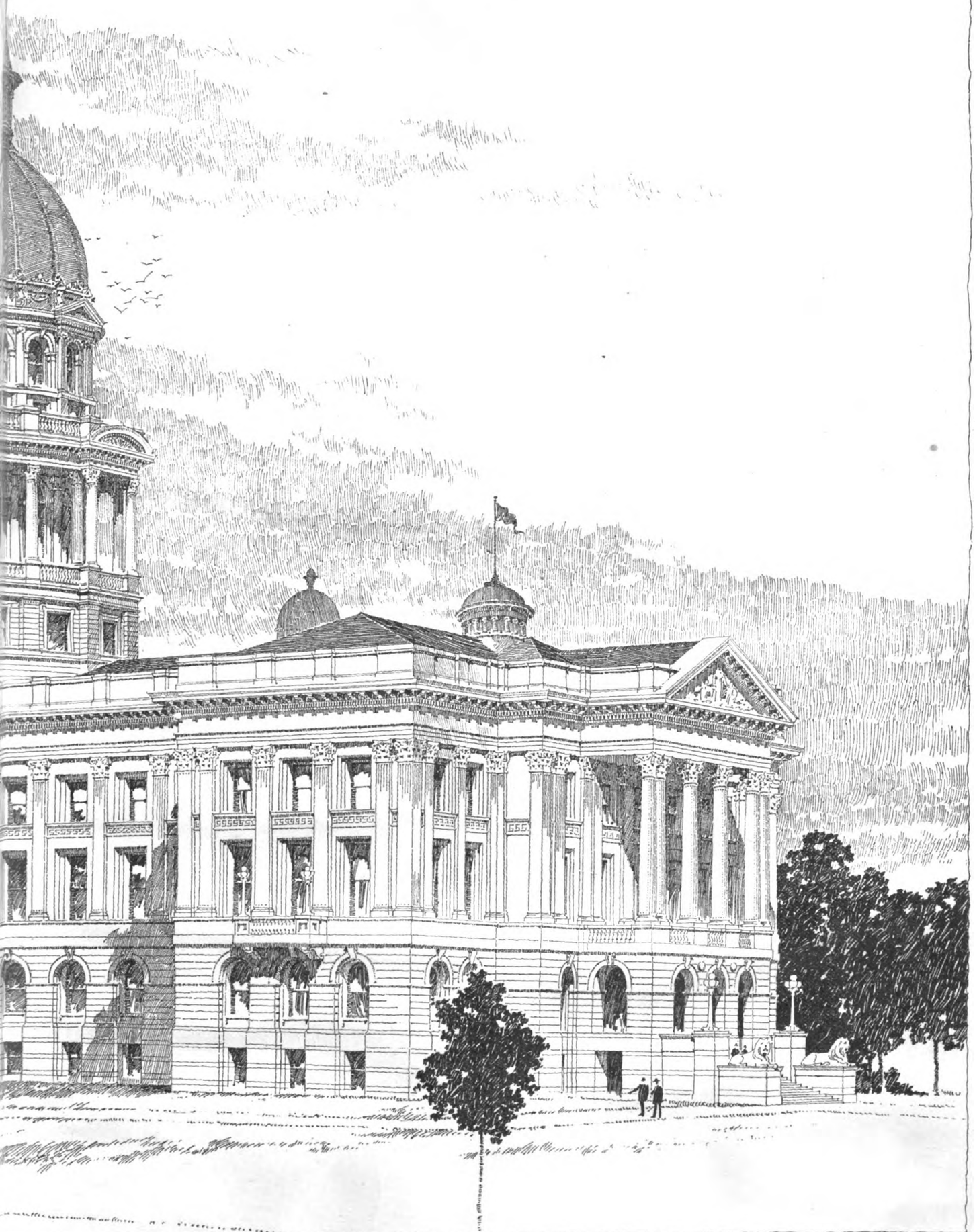


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COMPETITIVE DESIGN FOR STATE HOUSE, OLYMPIA, WASHINGTON.

WILLIAM COWE and G. F. HARVEY, Architects, Denver, Col.

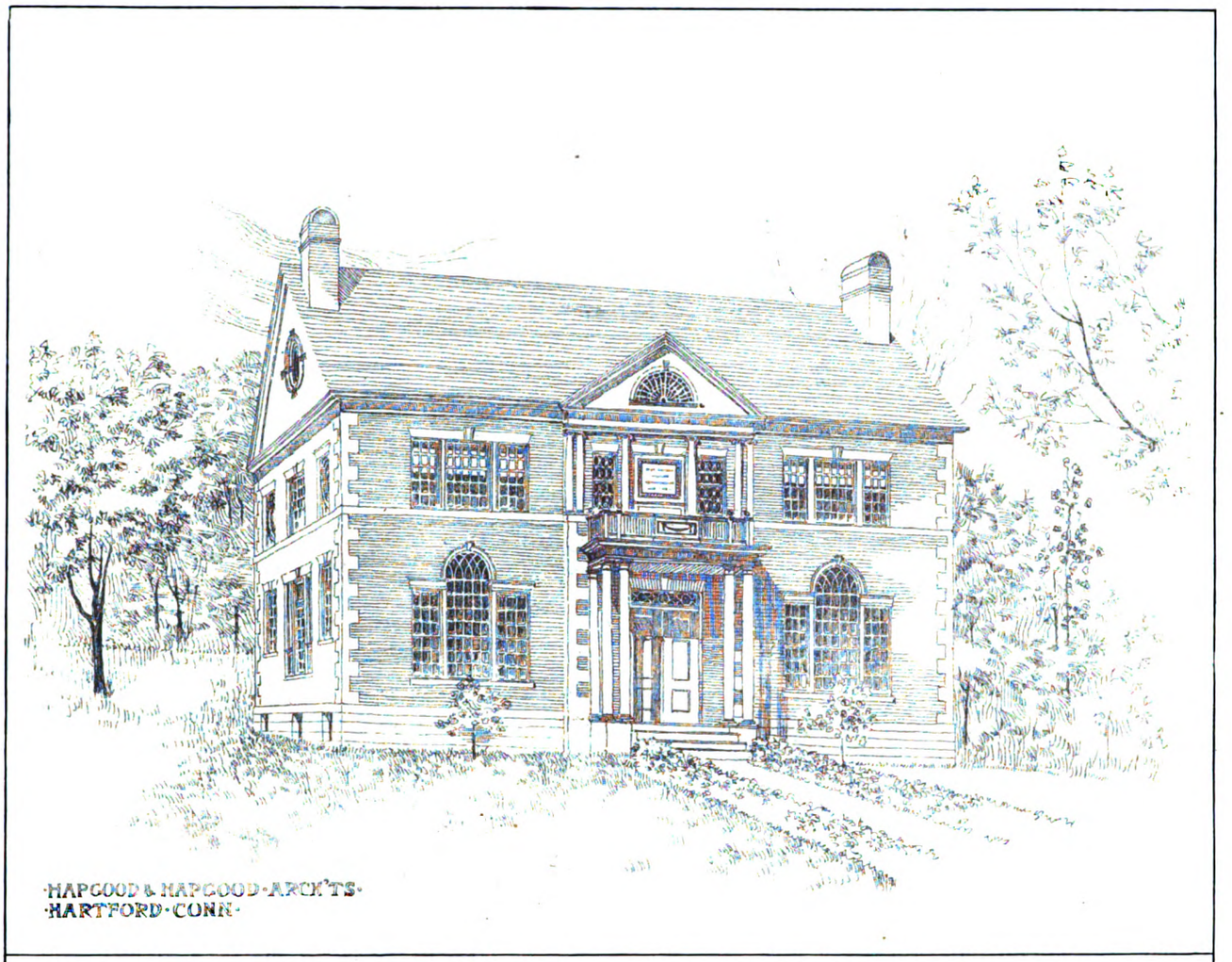


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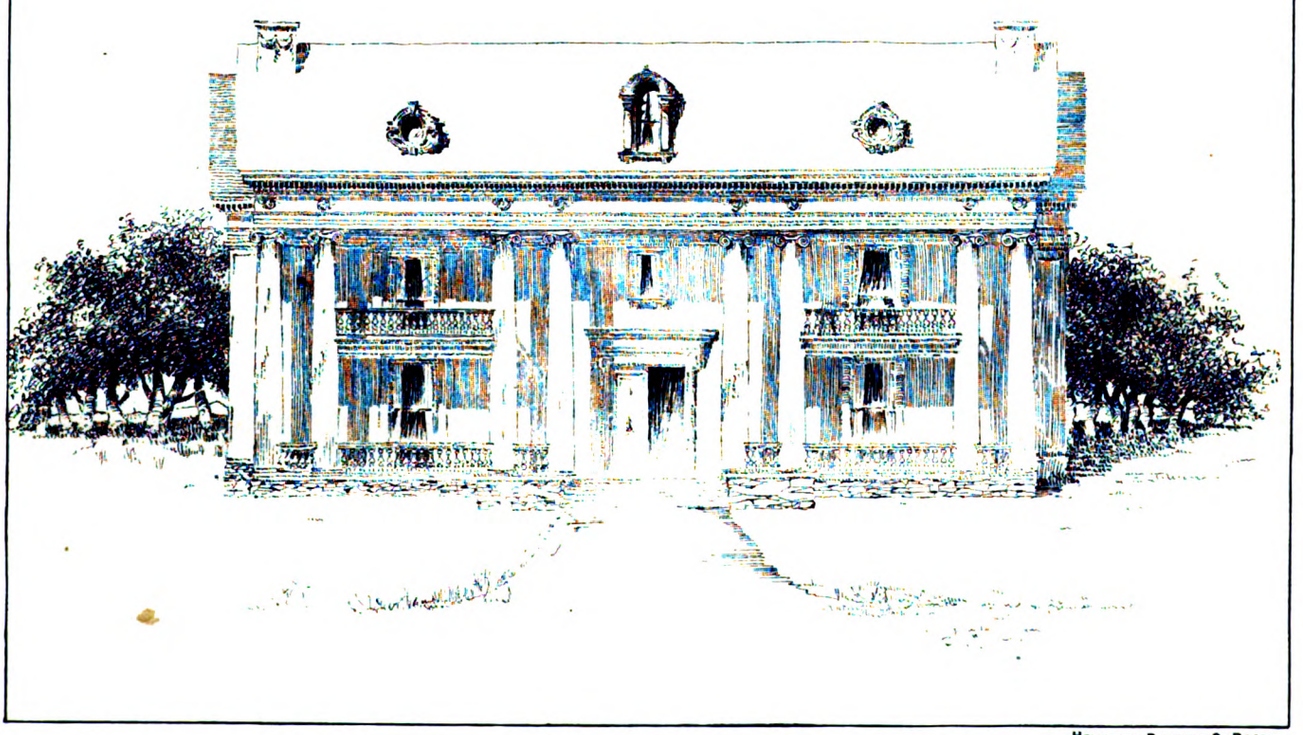
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·House of Paterson N.J.
·for Judge Scarr·
·Charles Edwards·Architect·



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FEBRUARY 10, 1894.

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THE Massachusetts Board of State-house Commissioners has repeated this year, with even stronger emphasis, its recommendation of last year, to the effect that, the rear addition to the Boston State-house being now nearly completed, the front portion should be pulled down, and a new structure erected, in harmony with the rear part; and a lively discussion is going on in the newspapers in regard to the matter. It will be remembered that, when the subject of securing better accommodations for the Massachusetts State Government was first agitated, two schemes presented themselves. One was, to pull down the present building, which occupies the back portion of a large lot, finely situated at the top of Beacon Hill, and arrange for the needs of the State in a new building, which could probably have been included within the limits of the present lot, and might, with such opportunities for effect as the lot afforded, have been made one of the most splendid buildings in the world. This idea was, however, strenuously opposed by a large number of people, who declared that the present State-house, which is certainly a beautiful specimen of the architecture of the early part of the century, ought by no means to be disturbed, and that the new accommodation required by the State ought to be obtained by building an extension, on the slope of the hill behind and below the present house, where its connection with the existing structure would be inconspicuous; and, in the end, this scheme was adopted, and carried out at a very great expense, as land already occupied had to be taken for the Extension.

IT was our opinion at the time, that the clamor which resulted in saddling the State, at an enormous cost, with the architectural absurdity of a vast tail-piece, five times the size of the present building, if we recollect rightly, tucked in behind it so as to be as much out of sight as possible, was in part due to sentimentalism, which was entitled to questionable consideration; and the correctness of this opinion is, we think, sufficiently shown by the fact that, even before the completion of the tail-piece, which was determined upon, to the sacrifice of all other interests, for the sole purpose of avoiding any interference with the present building, the representatives of the State began to urge the necessity of tearing down the very structure which the entire proceeding had been intended to preserve. The Commissioners said last year, and say again this year, that the old building is perishable, and is already decaying [the deterioration, though, is slight and of such a nature that the expenditure of a very modest sum would secure the preservation of the building for another half century at least]; but everybody knew this before the Extension was planned; and, as the Legislature decided then that it was better to keep this perishing structure intact, there is tenfold more reason now for preserving it, in preference to allowing it to be superseded by a mere addition to the tail-piece just approaching completion. Nevertheless, as we said when the whole matter was first brought up for consideration, the fact that the old building, in its present condition, could not resist decay for many years longer, and might vanish in a night if fire should start in it, is one that must be considered, and the Boston Society of Architects, which rarely interferes in public questions, has done the State a service in suggesting the only reasonable solution of the problem as it stands at present: that, instead of tearing down the old building, it should be made permanent, by rebuilding the floors and roofs with iron, in place of wood. This could be done, as appears from the report of a committee appointed by the Society to inquire into the matter, without altering the walls, except to substitute marble for painted wood, or changing the appearance of the structure in the least; and the Society proposes, in reconstructing the interior, to restore Bulfinch's arrangement of the rooms, which have been subdivided, and otherwise modified, greatly to their detriment. This sensible plan, the only one, as it seems to us, now compatible with the attainment of the objects to gain which the State has already expended millions of dollars, has received, apparently, the unanimous support of the architects of the city, seconded by a large number of artists and other citizens; and it is likely to go before the Legislature backed by immense influence.

THE New York Chapter of the American Institute of Architects in its wisdom has seen fit to adopt and lay before the public a resolution which we esteem to be one of the most remarkable documents that ever found its way into print. It is, we feel sure, generally supposed in New York that the leading organization of architects in that city is a body of earnest men whose aims and efforts are serious and not trivial. It is on this basis that the New York Chapter is officially recognized in municipal matters and we cannot conceive why it should have been willing to imperil its standing with the authorities, by declaring in the preamble to the resolution in question that "there is nothing now before the profession more important than the speedy production of a history of the A. I. A."!

WE have before noted some of the woes of the architects of the New York militia armories. The Seventy-first Regiment armory seems to be just now most conspicuous. A few days ago, a meeting of the Armory Board was held, at which Captain Wilson, of the Second Battery, complained that the only way to get the ashes from the boiler-room out of this building was by hauling them in carts over the armory floor. This process did not improve the appearance of the room, and after the ash-carts had been emptied, it was necessary to store them in the armory among the gun-carriages, which, as he mildly observed, had a very unmilitary effect. Mr. Thomas, the architect, thought that the ash-carts did not hurt the floor any more than the gun-carriages, but the Board appeared to agree with Captain Wilson, as will also, we imagine, most of our readers. The fact is that, in many places besides New York, armories seem to have been designed with little conception of their proper purpose. For example, nearly all the new armories which are being erected in the Eastern States are of brick, a most unsuitable material. It will be remembered that some years ago, the State of Massachusetts built a costly new prison, which, by a similar oversight, was of brick, instead of stone. The prisoners were transferred to it, and in less than a day the most dangerous one of the lot had worked his way out of his cell, by the simple process of digging out the bricks, one by one, with a small iron bar; and he was soon followed by others. After going to a heavy expense in lining some of the brick cells with steel plates, the Massachusetts authorities finally abandoned their new prison, as unsuitable for its purposes, and moved the prisoners back to the old granite structure which had held them safely for nearly fifty years.

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FOR armory-building, the conditions are nearly the same as for the construction of prisons. Sooner or later, the great city armories will be the objects of attack, probably by mobs, bent on getting possession of the arms that they contain; and they ought to be designed expressly to resist such attacks. There are few of our readers who are not old enough to recollect the riots of 1863, when many armories were plundered in this way, and others would have been, if they had been built after the modern style. When a building can be entered only by the door, a dozen men can defend it for a long time, as was the case in Boston, where a cannon, loaded with bullets, and fired just as the door was broken in, put to flight a great mob, and saved the arms in the building, and, probably, many lives; but a brick building, which can be entered by men armed with "pinch-bars" in fifty places within a few minutes, gives very poor protection to anything inside it; and, in case of a sudden assault, the field-pieces, Gatling-guns and rifles, with which the new armories are stored, would be at the mercy of a riotous mob.

THE artistic world has met with a great loss in the death of Mr. John Wolfe, of New York, one of the most accomplished collectors and connoisseurs in painting of his time. Mr. Wolfe was educated in France, and began there, while hardly more than a boy, collecting on a modest scale things that pleased him. He came to New York just before the Civil War, and took up mercantile pursuits, but the war destroyed his business, and after meeting with heavy losses, he retired altogether. While his affairs were involved, he sold the collection of pictures which he had then formed, and which contained, among others, Couture's picture of the "Day Dream." After parting with these treasures, he was able, by degrees, to acquire others, and in 1882 he sold a second collection, the principal picture in which was Bouguereau's celebrated "Nymphs and Satyrs." This beautiful work was bought by Mr. Stokes, and has ever since adorned the bar-room of the Hoffman House. Mr. Wolfe was a cousin of Miss Catherine L. Wolfe, the generous benefactress of the Metropolitan Art Museum. No doubt his knowledge and discrimination served her in making the splendid collection which is known by her name, and which, in accordance, it is said, with his earnest wish, she bequeathed to the Museum. Mr. Wolfe was a life member of the Architectural League, and of the American Art Association, and was one of the founders of the National Academy of Design.

MR. GEORGE CHAMPLIN MASON, whom our older readers only will recollect as an architect, died in Philadelphia last week, at the house of his son, Mr. George C. Mason, Jr., who was at one time Secretary of the American Institute of Architects, and is well known in the profession. Mr. Mason the elder was born in Newport, R. I., in 1820, and has always been identified with that city. He was educated as an architect, and built many fine houses and other buildings in and about Newport. He was always of a literary turn of mind, and, while in the active practice of his profession, found time to edit the Newport *Mercury*, and to write several books, treating particularly of Newport and its history. Later, after his son had become associated with him in his business, and he had more leisure to devote to other matters, he became widely known, under the name of "Champlin," as a contributor to the magazines and newspapers of articles on topics of local archæological and literary interest, not a few of which were published in the *American Architect*. Since the removal of his son to Philadelphia, we believe that he had not practised his profession at all, but he continued his literary work until within a few months. He will be greatly missed in Newport, where he was well known and popular, both among the residents and the summer cottagers, many of whom had been his clients.

THE Municipal Art Society of New York proposes to make its influence felt in affairs within its province in the metropolis. At the meeting of the Executive Committee of the Society, held the other day, at the office of McKim, Mead & White, terms were drawn up for a public competition for the decoration of the Court of General Sessions, in the new Criminal Court Building, on Centre Street. The competition is open to all artists of either sex, and the first prize will be the commission to execute the work, money prizes being awarded to the second and third in merit. The jury, in all competitions held by the Society, will consist of fifteen members, of whom three are to be architects, seven painters or sculptors and five laymen, all the members being appointed by the Society. A decorated court-room will be rather a novelty in this country, but if such a room is to be painted at all, it should be well painted, and nothing is more likely to encourage the study of decoration among artists than competitions of this sort. In the present case, the Society will bear all the expense of the decoration, but it may be hoped that, the example once set, municipal art will not long need to depend upon the charity of private citizens.

NEXT year an extraordinary exhibition is to be held in Japan, where the resources of that wonderful country are to be displayed as they have never yet been. The exhibition is to be made in Kioto, and is to commemorate the eleven-hundredth anniversary of the establishment of that city as the capital of Japan. The buildings are to reproduce, as nearly as possible, the great palace built for the Mikado when he first took up his residence there, with such additions as may be found necessary. It is hardly necessary to say that porcelains, carvings, metal-work and embroideries will be shown in profusion, and the modern manufactures of Japan will also be represented, together with mining products and processes. The most curious exhibit, however, is one which nobody else seems to have thought of, but to which the Japanese Government intends to give an extensive development. This is a religious exhibit, comprising, so to speak, processes as well as apparatus. On the grounds there are to be temples of the various sects represented in Japan, including Christian churches, if the communities of Christians choose to furnish them, and in each temple or church will be stationed priests, who will not only perform the appropriate services, but will expound the doctrines of their sect to all who wish to listen to them, interpreters being provided, who will translate the discourses for the benefit of foreigners. Whether this exhibit is competitive, we are not informed, but there is something interesting in the seriousness with which the Mikado, the consecrated ruler of the Empire, proposes to spread all religions clearly and impartially before his subjects, for them to choose as they would between different systems of electric-lighting. The police regulations will be strict, so that no extortion will be practised upon strangers, and interpreters will be furnished by the reception-committee to those who wish for them. Nearly all the members of the committee in charge of the exhibition are well known in this country. The President is Prince Komatsei. M. Saito, the Director-general, is Secretary of Legation to the Japanese Embassy; the Chief Judge, Mr. Kuki, was formerly Minister to the United States, and the other directors, Messrs. Ashiwara, Yamataka, Niwa, Yanagiwa, Ariga and Yoshimura, have either resided or visited in this country. This indicates that Americans will be particularly welcomed at the Exhibition, and they could hardly go to any place where they would see more curious and interesting things.

THE real-estate editor of *La Semaine des Constructeurs*, M. Léon Mauruc, relates the experience of one of his clients, who had amassed a considerable sum of money, and, being afraid to entrust it to banks, or invest it in stock companies, hid it in an old bureau, and, for six years, hunted all over France for a real-estate investment to his liking. He attended nearly all the auction sales, and employed M. Mauruc to examine more than two hundred estates, none of which suited his ideas. At last, he heard of a property which offered attractions for a thrifty man. The house was old, certainly, but the total rental amounted to fifteen per cent on the investment, and the temptation was too great to be resisted. The money was extracted from the secret recesses of the bureau, and exchanged for the title to the old house. When rent-day came around, the purchaser set out to collect the first instalment of his revenue, but was unpleasantly surprised to find, that most of the tenants, quite unmindful of the obligations contained in the leases which had been shown him, not only refused unanimously to pay any rent at all, but, arming themselves with such weapons as lay nearest at hand, drove their new landlord incontinently from the premises. On next rent-day the same performance was repeated, and, so far as appears from the story, the unfortunate investor is still seeking for some one with courage enough to extract his rents from his unruly tenants.

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THE FRENCH RENAISSANCE.[1] — II.

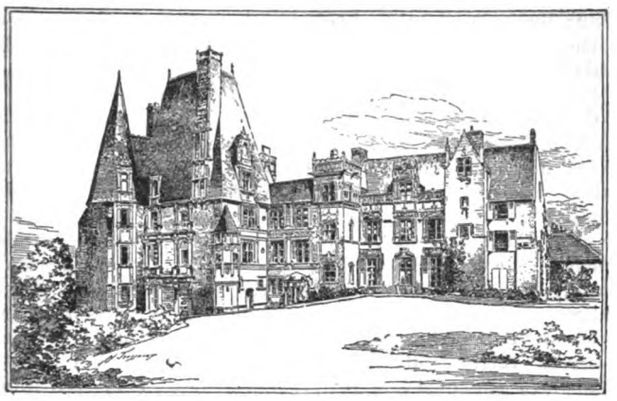


Fig. 2. Château of Fontaine-Henri (Calvados).

FRANCIS I had, in fact, in arts as in letters, a direct and individual part in the intellectual movement of his epoch, much more than any king of France had had before him. In spite of his profligacy and his political blunderings, he possessed all the most generous, most enthusiastic, and most elevated qualities of the Valois family, and he was not the only one of his race to render most eminent service to architecture. Charles V and his brother, Jean de Berg, whom we have mentioned, were builders as intelligent as they were lavish; their nephew, Louis d'Orléans, and his son Charles, the father of Louis XII, deserve to be associated with them; the brilliant dukes of Burgundy were likewise of the Valois family. The Valois were thus for France, but in a less degree, what the Medicis had been for Italy.

Louis XI, whose aspirations were vulgar enough, trenched too much, by far, on the dominant spirit of his race; Louis XII had more taste, but it did not run in the direction of novelties. The reparative reign of the "Father of the People" would, perhaps, have been lost on the Renaissance, if it had not already germinated and appeared above the soil, and if the minister of Louis XII, Cardinal Georges d'Amboise, had not resolutely taken upon himself the duties naturally devolving upon his sovereign. While the latter, in the wing of the castle of Blois which bears his name, timidly entrenched himself in Gothic traditions, the former, in the Château de Gaillon, allowed himself full reign and bequeathed to his country the greatest and noblest construction which had been reared in the new style during the first fifteen years of the sixteenth century.

In justice, it must, however, be said that the severe Anne de Bretagne — to whose ascendency one might be attempted to attribute the indifference or lack of enthusiasm for what was going on in France, displayed by so many high lay and ecclesiastical barons — was able, on the contrary, to discern better than any one else the marvellous talent of Michel Colombe, who was in a peculiar sense her subject, since he was a Breton. It was in his *atelier* that the new ideas were warmly welcomed and from which the Italian artists were not excluded: it was in this true home of the Renaissance that she sought a plan and workmen for the execution of the mausoleum of her father, duke Francis II, and of her mother. The tomb of the sons whom she had borne to Charles VIII, was of the same origin. Louis XII himself, when he wished to erect to his grandfather, Louis d'Orléans, and to Valentine, his grandmother, a monument out of the ordinary style and worthy of such ancestors, turned to Milanese and Florentine artists — it was sculptured at Genoa: this tomb, stranded, after the Revolution at Saint-Denis, from the wreck of the Celestins at Paris, is naturally a stranger to all Gothic traditions, and even the epitaph is of the kind dear to the Latinists of the peninsula.

The Château de Gaillon is the most complete and the most characteristic specimen of what has been termed, for want of other historic designation, the Louis XII style; this style may be considered as extending four or five years beyond the reign from which its name is taken; and this period, as may well be supposed, is, even at Gaillon, a transitional period.

Architects allowed the old national methods to be encroached upon but imperceptibly; they by no means surrendered the supremacy at once to ultramontane methods. Gothic processes continued to hold sway in the structure, the general dispositions and the proportions; the vault was ribbed; the arch was either flat or broken, and, when framed with a Classic order, the latter had only pilasters and, consequently projecting but slightly, did not attract undue attention. The roofs, instead of being lowered, instead of approaching toward the obtuse angle of the Greco-Roman pediment, tended, on the contrary, to become excessively pointed (Fig. 2). The mouldings penetrated the arches, the bays, and the bases of the pillars. The decoration of the bays was cut deep in the embrasures: this was the relief system inaugurated in the Romanesque period. The frames of the bays, and the ribs of the vaulting preserved the angular sections of the fifteenth century, the windows kept their mullions and intricate networks or their stone crosses (Fig. 3), which disappeared only after the time of Louis XIII; the Corinthian capital was always preferred, because it is in a way akin to the Gothic; it is often so treated as to be quite like it, and sometimes we see it, in the same column, associated with a cordiform base (Fig. 4). The niche with a canopy, the pinnacle, the balustrade with openwork notches and corbelling, all flourished as in their palmy days. Few important edifices were completely rebuilt, few were undertaken on new sites. At Gaillon, the former external perimeter was almost exactly followed, when, by skilful expedients, the interior court was successfully reduced to a rectangular plan. Bury, near Blois, and Le Verger, are exceptions; but the feudal prerogatives assert themselves there in great angle towers, symbols of power, which no one was inclined to abandon.

A comparison of the style of Louis XII, with the early Pointed style will indicate more clearly than anything else the difference, or contrast existing between an architectural style created for material or moral needs and one adopted under the pressure of æsthetic requirements. In the twelfth century, new principles were triumphant, and the forms resulting therefrom at first hardly changed anything except the interior, and there the alterations were mainly in things which strike the casual observer least; at the same time these principles played the most prominent part in the construction. The vault became ribbed, the framing arches supporting it terminated in a point, while no visible change in the profiles, capitals, decoration, secondary arches, or disposition of the towers, bore unmistakable evidence of the revolution accomplished; so true was this that a church of the French school built about 1160, entirely Gothic in essence and framework, appears externally to be purely Romanesque. Altars, altar-screens and tombs

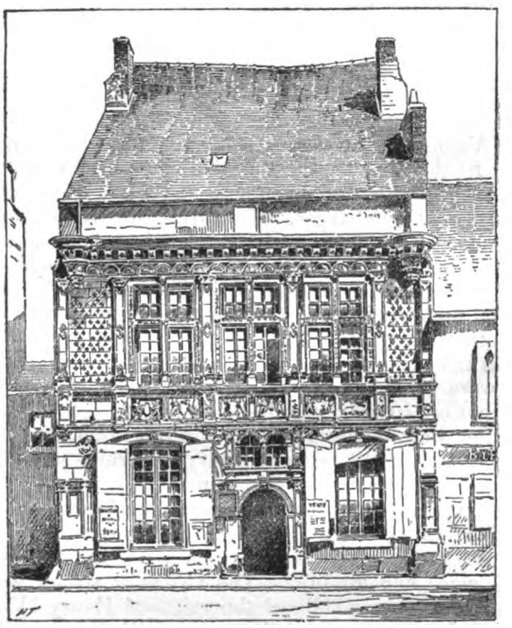


Fig. 3. Hôtel de Ville, Beaugency.

continued to be in the Romanesque style for more than a quarter of a century after the consecration of the Church of Saint-Denis. But as programmes called for the progress which was being realized in the structure, this progress became

[1] From the French of Anthyme Saint-Paul, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 945, page 52.

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more and more marked and, spreading rapidly over regions where it was necessary, it quickly had the mastery over all the routines which, moreover, had not had the time to entrench themselves. In the sixteenth century, on the contrary, the forms of art being adopted because they were pleasing, they were at once conspicuously displayed; and, from the points most exposed to view, but of secondary importance, they passed slowly to the organic elements; these they did not definitely supplant until after their nature or their aspect had rendered them irreconcilable with the invading tendencies of the Greco-Roman orders. Besides, since one was to choose according to his individual humor, the man who preferred tradition to novelties, safe and well-tested practice to experiments and ventures, in which the efforts and risks might not be counterbalanced by the final result, clung to what he had learned or what he had already seen done; for this reason, until the Renaissance had half run its race, and even later than that, Gothic edifices were numerous, churches at least, in the regions first won over to the great architectonic revolution of the sixteenth century. There are sections like Beauvais, Valois, Vermandois, Amiénois and, for better reasons still, Artois, Flanders and Franche-Comté, then foreign provinces, which the Louis XII transition did not touch, as it were, and in which the following evolutions respected the greater part of the religious monuments. In Valois, the Gothic bell-tower, with its lace-work spire and other details, was familiar to master-masons down to about 1600. In the transept of the Cathedral of Beauvais, which was crowned, about 1550, with a wonderfully bold tower, nothing with the exception of two doors bears the stamp of the prevailing taste of the time. In the very centre of Paris, a few steps from the Louvre, the Church of Saint-Merri was erected, from 1520 to 1612, in a but slightly altered Gothic style; a similar remark might be made as to the Church of Saint-Gervais, if its date were better established. It was, however, at Paris that in 1532, the church was begun in which the Renaissance, in the field of religious architecture, engaged in the supreme and victorious struggle against Pointed art: we refer to the celebrated Church of Saint-Eustache.

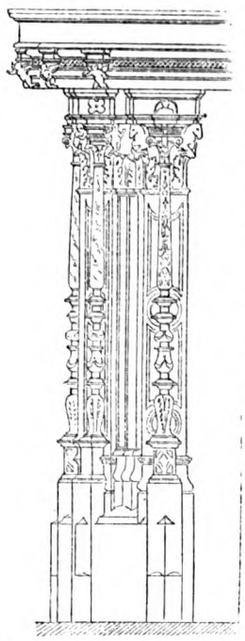


Fig. 4. Details of the Château of Arnay-le-Duc.

In 1515, François I ascended the throne, and with him the Renaissance; and it was only at the death of the last prince of the Valois (1589) that it made way for Classic art, represented by the Bourbons. But this change of styles was not accomplished with the abruptness and haste which characterized the political changes. To mark correctly the duration of the French Renaissance, without running the risk of giving rise to false notions, we should consider the reigns as only approximate guiding-points, and the dates should be expressed in round numbers capable of a certain elasticity. With these reservations, the years 1520 and 1590 may be reasonably fixed upon as the two extremes of the existence of our Renaissance. They were preceded, as we have said, by a transition which imperceptibly stripped the Renaissance of Gothic characteristics; they were followed by a second transition, corresponding nearly enough to the reign of Henry IV, which paved the way for the advent of modern architecture.

We must also make allowances for such sections as were belated or that clung heroically to glorious traditions. There were provinces where the local genius manifested itself with special vigor and vitality. The Orleanist school was maintained down to the middle of the reign of Henry IV, or until about 1600; the schools of Troyes and Toulouse until toward the end of the reign of Louis XIII; the Breton school until at least the middle of the reign of Louis XIV, the same as the Flemish school; on the banks of the Loir, at Montoire and Le Lude, we have seen houses of the latter part of the eighteenth century, which, but for the dates they bear, we should have been tempted to refer to the reigns of François I and Henri II. There is nothing surprising in this, if we remember that Gothic churches continued to be built down to the Revolution of 1789: for example, the abbey-churches of Saint-Maixent and Corbie, the bell-tower of Fontenay-le-Comté, and the Cathedrals of Blois and Orléans.

Let us add that the Renaissance, which came upon the stage in decorative work and details, likewise quitted it in decorative work and details. It appeared in fireplaces, tombs, baptisteries, holy-water basins, altar-screens, and stalls during the entire reign of Henri IV and that of Louis XIII. In addition, certain constructional processes which are thought not to be always advantageously replaced by Greco-Roman processes remained in vogue during the seventeenth century and a part of the eighteenth; the ribbed vault, the stilted arch, the flying-buttress (often reduced to such a scale as to serve as a decorative motive in bell-towers, domes and dormer-windows), the staircase turret and corbelling; this last has never been abandoned and one sees it still marvellously employed under Louis XV and Louis XVI.

The period of seventy years, which we have assigned to the French Renaissance, was not an era of rest; between the two transitions, at either extremity, art did not remain stationary, and the time can even be divided into three distinct secondary periods; these have been named the François I, Henri II and Charles IX styles. We will confine our discussion to the first two, that of François I, extending from 1520 to 1550, and that of Henri II, including the reigns of this monarch and of his sons. If archæologists were more inclined to be gallant, nowhere could this quality be exercised to better advantage than here: to be just, the style of Henri II should be termed that of Catherine; it would be a much more accurate designation, not only as regards its duration, for Catherine de' Medici lived nearly to the close of the period, but also as to personal aid and influence, in which the queen, who was a friend of the arts, participated to a far greater extent than did her husband and her three sons. One of these four sovereigns, *Charles* IX, if he had lived longer and in less troubled times, might have won the right to substitute his name for that of Catherine. The term which we suggest would have, besides, the merit of paying implied or indirect homage to the part which such other women as Diane de Poitiers (tomb of Pierre de Brézé, at Rouen, Château d'Anet), Anne de Polignac (La Rochefoucauld and Onzain), Gabrielle de Bourbon (Thouars), Helène de Hangest (Oiron), Jeanne de Vivonne (Dampierre-sur-Boutonne), and Blanche d'Aumont (Javarzay), to say nothing more of Anne de Bretagne, played, in the sixteenth century, in the development and applications of architecture — a part which M. Palustre has ably set forth.

(To be continued.)

PUBLIC SQUARES.[1] — II.

THE TRAFFIC SQUARE.

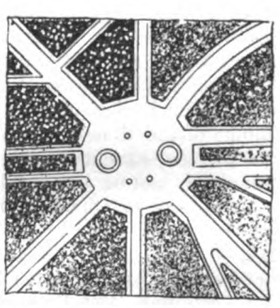


Fig. 15. Place Pereire, Paris, France.

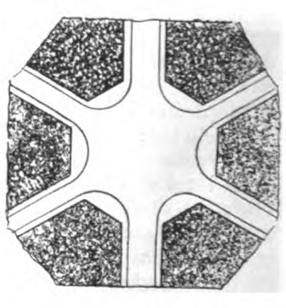


Fig. 16. Place de Strasbourg, Lille, France.

THIS form of square is really a street enlargement on an extensive scale.

The form of the traffic square is usually a circle (Figs. 15, 12 and 13), or a regular polygon (Figs. 16, 17); and less seldom a true square (Fig. 18) or a rectangular one (Fig. 19). The circular plan with a small diameter is not suited for being built around, nor is it agreeable for the pedestrian who is obliged to take either a circuitous route on the sidewalk or a long street-crossing. The semi-circular or polygonal plan distributes the flow of traffic in a fan-like

[1] A graduating thesis by T. M. Newton of the Architectural Department of Columbia College, New York. Continued from No 945, page 54.

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manner and is particularly well-adapted for railroad-stations (Figs. 17 and 20).

The use of refuges is shown in Figures 15, 17 and 20. They are very common in London and Paris and when carefully located they direct the traffic and prevent confusion. If put in the neutral space between two adjacent intersecting streets, they offer but little obstruction to the traffic. The larger the square the more necessary are refuges and garden beds on which are placed candelabra, bill-posters, urinals, booths and small waiting-stations for the street-railways.

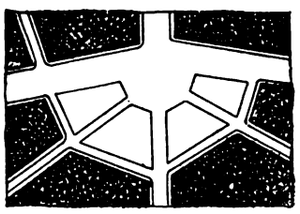


Fig. 17. Weisathurmplatz, Strasbourg.

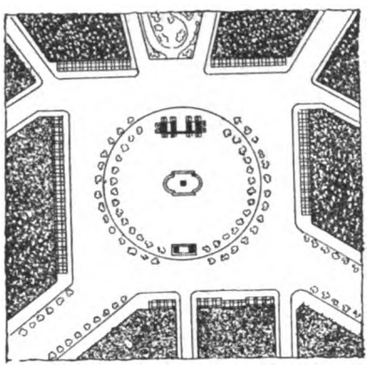


Fig. 18. Piazza Cavour, Florence, Italy.

Rows of trees, fountains and (very seldom) monuments are found only in large traffic squares. The Piazza del Popolo (Fig. 21) is peculiar and of great beauty and a particularly fine example of this kind of square.

The name "star square" is given to such squares as the Place de l'Etoile (Fig. 13), Place des Nations, Place d'Italie and the Place d'Eylau, Paris (Fig. 12). These are celebrated for the panorama-like views along the radiating streets. Such views are seen in Antwerp, Brussels, Berlin, Dresden, Rome and Florence, but they are particularly remarkable in Paris where the vistas of effective street architecture are heightened by carefully-arranged plantations and artistic end-views. The star square is effective and pleasing

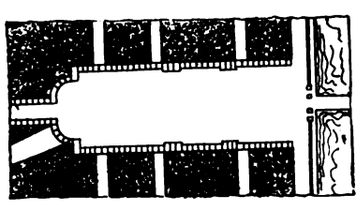


Fig. 19. Piazza Vittorio Emanuele, Turin, Italy.

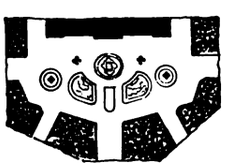


Fig. 20. Ernst-August Platz, Hanover, Germany.

only in large cities, full of life and animation, where the radiating avenues are well built-up, as in Paris, Rome and Florence.

The traffic square in general and the star variety in particular should be used in small and medium-sized cities only when necessary, as the simple street-crossings and the pleasingly-arranged street-connections, in most cases, satisfy the requirements without the disadvantage of confusion.

The Market Square. — This is the name given to the open square which serves as a market and which, when necessary, it should be possible to use for exhibitions and public festivities.

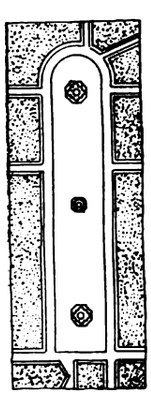


Fig. 22. Piazza Navona, Rome, Italy.

The necessity of open places for the sale of vegetables, fruit, flowers and for exhibition-buildings has not disappeared and a city should so provide for its squares that if in the future it becomes necessary they can be altered into children's playgrounds, garden-squares or sites for a public building.

It is best to place the market-square as near as possible to the centre of traffic, keeping in mind, however, that it is in its nature the opposite of the traffic square, as regards the city flow, which must pass at least on one side but never through it. The market-place is more suitable than the traffic square for decoration by plantations, as the rows of trees are useful in marking-off the space for the booths and in giving shade to the buyers and sellers. This kind of square is suited, but not very well, for public festivities and carnivals, which should be provided for in all large cities by separate squares. These should be sunk and surrounded by terraces. When a square serves the double purpose of a market and a place for public festivity, its subdivision by trees and beds of plants should be avoided and the ornamentation restricted to gates, sculptures, obelisks, masts and fountains.

The Piazza Navonna, Rome (Fig. 22), and the Königsplatz at Cologne (Fig. 23) are particularly suitable for markets and public carnivals; the latter being also used for military drills and parades.

In London, the concavity of the circus square is successfully used as a cab-stand, but other and better arrangements are shown in Figure 24.

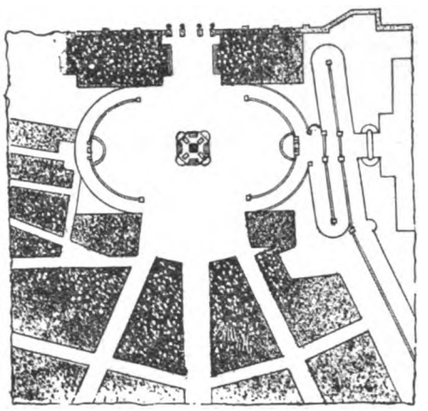


Fig. 21. Piazza del Popolo, Rome, Italy.

The Garden Square. — This species of square serves particularly the needs of the public health, comfort and recreation, and is at the same time one of the best means of city decoration. The more crowded the city quarter, the more necessary becomes the garden square for the public health.

London and Edinburgh are justly celebrated for the number and arrangement of these squares. The West End city quarter of London (Fig. 25), comprising the Russell, Torrington, Woburn, Gordon, Tavistock and Euston Squares, and the new city quarter of Edinburgh from Princes Street to St. Stephen's Church (Fig. 26) are most pleasing examples of connected garden squares. Two beautiful examples of this kind of square are shown in Figures 27 and 28; the latter is particularly to be remarked.

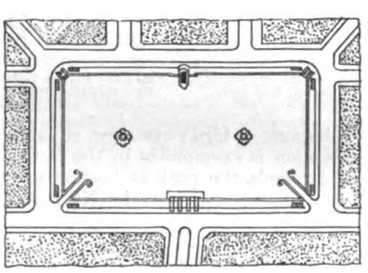


Fig. 23. Konigsplatz, Cologne, Prussia.

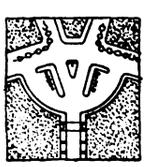


Fig. 24. Carlsplatz, Munich, Bavaria.

The natural attractions of the garden square are enhanced by fountains, aviaries and the like.

The French incline more to outward grandeur than to rural beauty, so that, in France, the garden square frequently serves as a mere street decoration. A beautiful example of the open garden square is given in Figure 29. It is decorated with fountains and works of art and is surrounded by a colonnade and welcomes the stranger entering the city from the railway-station.

In the last decade it has become the custom in Europe to surround public buildings with grass and foliage and make provision for garden squares in the city enlargements. The best examples of this movement are to be found in Berlin, as Figure 30. They are certainly efforts worthy of a large city. The Königsplatz would perhaps be more effective if it were not unnecessarily cut up by the street that curves through it. The Schlossplatz at Stuttgart (Fig. 31), decorated with columns and two fountains, is one of the most beautiful palace fore-squares in the world.

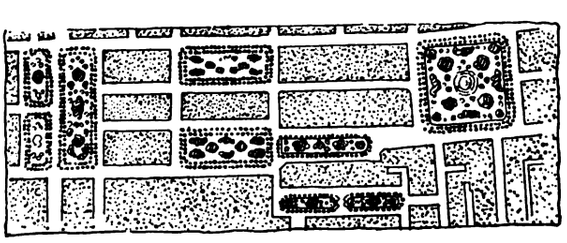


Fig. 25. Garden Squares at the West End, London, England.

Figure 32 shows a square that is not cut through by any foot-path

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or street. It serves as a decoration and, together with the sidewalk islands at its wider end, helps to direct the traffic. In opposition to traffic and market squares, the garden square should be removed from the course of traffic which at most should touch it on one side only. An example of a square unhappily placed and too much cut up is shown in Figure 33. The Albertplatz at Dresden (Fig. 34), which serves both as a traffic and garden square, is cut up as little as possible.

The crossing of the garden square by one or more streets of traffic is not to be tolerated and is allowable only when each resulting division makes an independent field.

Garden squares, like all other garden arrangements, are best placed in valleys, partly on account of the protected and favorable position for plant growth and partly because a bird's-eye view is so much more effective. The valley location is exemplified by the Botanical Garden near the Rue Royale, Brussels, the park at Laeken and the new People's Garden at Cologne; in a less degree the Karls-Aue at Cassel, the park construction at Frankfort-on-the-Main and the Public Garden of Milan, the view of which from the neighboring high streets is particularly picturesque. The plant growth of a garden square should not be forest-like nor disturbing to the architecture. In general, it should be low and subordinate and especially so when serving as the foreground for a building. Single high groups of trees are not to be excluded as they are frequently necessary to hide an unattractive view, surround an artistic object or to give scale. A geometrical arrangement of the plants is to the purpose where the square is small and sunk below the surrounding streets. In Europe the garden square is frequently designed to serve as a play-ground for the young, without lessening its ornamental value as a square.

Several garden squares are more to the purpose than a single large one, as there is a more equal distribution of the advantages to be gained from them.

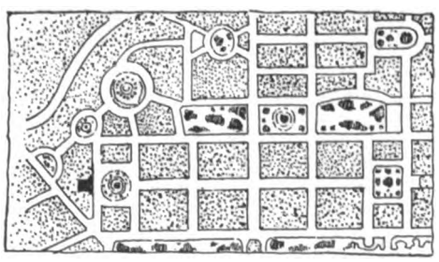


Fig. 26. Connected Squares, Edinburgh, Scotland.

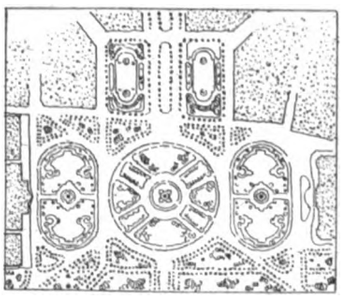


Fig. 30. Konigsplatz, Berlin, Prussia.

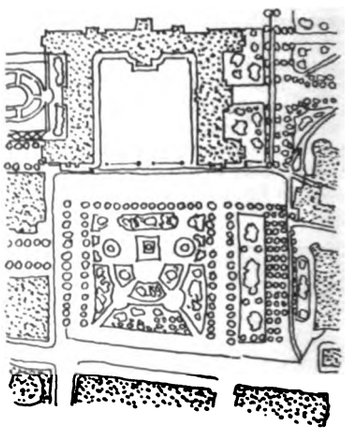


Fig. 31. Schlossplatz, Stuttgart, Wurtemberg. 180m x 210m.



Fig. 27. Red Lion Square, London, England.



Fig. 28. Finsburg Square, London, England.



Fig. 29. Piazza Carlo Felice, Turin, Italy.

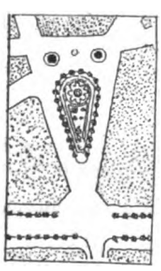


Fig. 32. Friesen-platz, Cologne, Prussia.

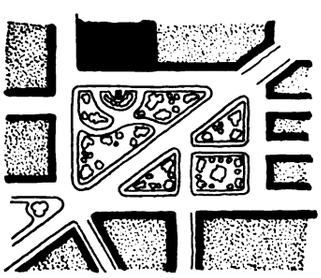


Fig. 33. Georgs-platz, Hanover, Prussia.

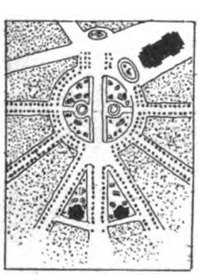


Fig. 34. Albert-platz, Dresden, Saxony.

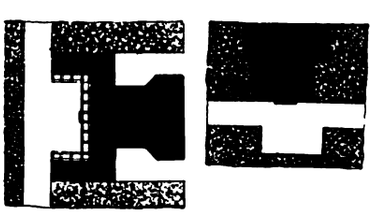


Fig. 35.

Fig. 36. San Giovanni, Brescia, Italy.

The Architectural Square. — Under this heading we discuss the square upon or around which the buildings are erected. A square upon which a public building stands we designate as the "built *upon* square," and that around which the buildings are erected, as a "built *around* square." We shall separately consider the fore-square that is placed in front of a building and the monument square, the shape and arrangement of which is greatly conditioned by the erection of a statue, column or other monument.

The Fore-square. — The site of a monumental building should be so selected that it may be seen without difficulty from both near and far. The distant view should show it in good perspective, inviting to closer inspection, but in satisfying both these requirements the traffic must not be inconvenienced. The location of a monumental structure on a broad street is not satisfactory for the building or for the city, but if it is so placed, the custom is to emphasize it by setting the main part of the building back from the building-line, covering up the sides of the neighboring houses with its wings (Fig. 35). It is common in France to enclose the recession, thus making a court.



Fig. 37. St. Maurice, Lille, France.

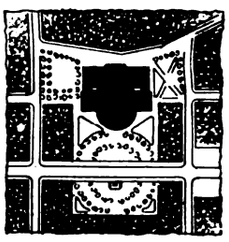


Fig. 38. Stadt Theater, Mainz, Hesse.

Figure 36 shows a fore-square placed on the opposite side of the street from the church. The appearance of a building, however, is much heightened if it is placed in becoming relation to the head of the street, on an open square of sufficient size. Only in such a position can the spectator be sure of a good view from both near and far.

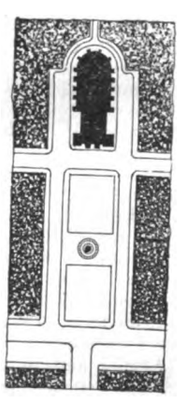


Fig. 39. Luisen-platz, Weisbaden, Prussia.

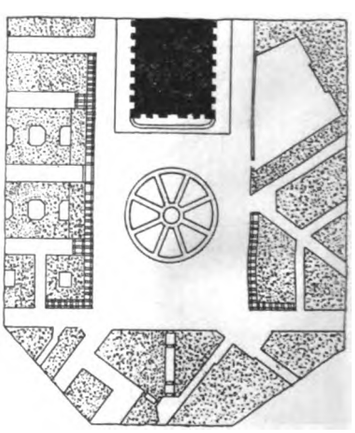


Fig. 40. Piazza del Duomo, Milan, Italy.

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The fore-square, intended to emphasize only the main façade, should have a depth equal to the height of the building or, better, one and a half times the height. The arrangement of a railway fore-place, worthy of study, is given in Figure 20.

Figure 37 shows buildings on a square entirely too contracted.

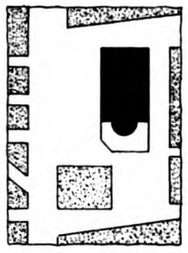


Fig. 41. Piazza del Duomo, Palermo, Sicily.

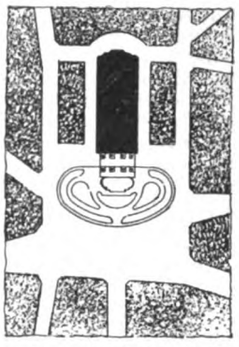


Fig. 42. Eglise de la Trinite, Paris, France.

Of more generous proportions is the Piazza Colonna (Fig. 9) with the column of Marcus Aurelius, Rome.

The fore-square of the Stadt Theatre at Mainz (Fig. 38) with the Guttenburg monument, shows how, on an unfavorably located square, the traffic can be regulated.

The Luisen-platz at Wiesbaden (Fig. 39) would be large enough for the church were it not divided by the Waterloo monument and the foliage.

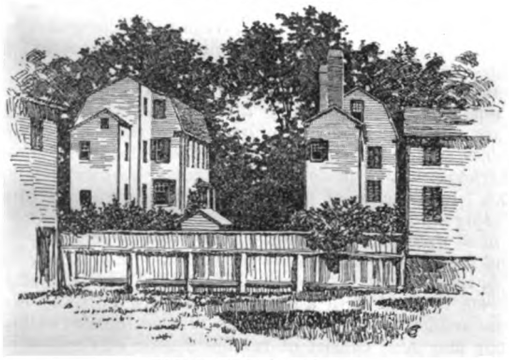
The large empty square before the Cathedral of Milan (Fig. 40) gives an impression of vastness, but it is exaggerated in size and suffers in comparison with the beautiful and smaller cathedral fore-square at Palermo (Fig. 41).

A most beautiful fore-square is that before the Church of the Trinity at Paris (Fig. 42). An ascending ramp, with a rise of a few metres, leads up from the square level to that of the church which rises proudly in height and forms the terminal point of view of the Chaussée d'Antin.

The most monumental fore-square is undeniably that of St. Peter's, Rome (Fig. 7). The dimensions are immense though not here excessive. The square consists of three parts, the Piazza Rusticucci surrounded by stores, the large oval inclosed on the sides by the Bernini colonnade, and the church square proper which is trapezoidal in shape, enlarging towards the church and flanked by colonnades. The ground of the oval slopes towards the centre where the celebrated obelisk stands on a stepped base, diagonally around which are arranged four candelabra. The fountains are placed at the intersections of the longitudinal axis of the oval with the chords of the encircling arcs. The rise from the centre of the oval continues on the axis up to the monumental steps which first lead to a terrace and then to the porch of the church. The cornice of the colonnade having the same rise as the ground, assists in conducting the sight of the spectator up to the gates of the first temple in Christendom. Both the Trinity Church at Paris and St. Peter's at Rome are instructive examples of that æsthetic requirement which demands that the site of a monumental building be raised above the surrounding ground. The Acropolis of Athens, the Villa d'Este at Tivoli, the Church of Santa Maria Maggiore at Rome, the Votive Church upon Montmatre and the Trocadéro Palace at Paris, the Palace of Justice at Brussels, the Federal Palace at Bern, Switzerland, and the Court Palace at Ofen, are monumental examples of this principle.

[To be continued.]

THE MODERN RAIN-BATH.



Old Houses, Salem, Mass.

SINCE the first introduction of the so-called "rain-baths" in Germany I have followed with keen interest and attention the gradual development and rapid spread of this new system of baths, and as it has been my good fortune to have been connected with the planning and construction of the majority of rain-baths installed up to date in this country, it occurred to me that a brief description of the new system would be of interest to the readers of the *American Architect*.

The form of shower or douche used in the rain-bath is not, in itself, new, for it has long been used in connection with the common bath-tub, and it has also been used separately in isolated cases: for instance, as an adjunct to swimming and Turkish baths, or in gymnasiums and athletic-club houses. In the modern "rain-bath" system, however, as recently advocated and applied, *tubs are entirely abolished*, simple douche or shower baths being substituted for the same and being installed as a distinct and independent form of bath. This does not, of course, apply to bath-rooms in private houses, but only to public baths, and to baths for institutions, for manufacturing establishments, for schools, etc.

One feature of construction is novel and of much importance, *i. e., the inclined angle at which the douche is placed in the rain-bath*, the object being to avoid a vertical stream from the douche striking the head of the bather, which to many persons is quite disagreeable. In the new form of rain-bath the bather stands erect under the douche, which is inclined in such a way that the luke-warm water strikes the body only from the neck downwards, and the head is not wetted except when the bather purposely places the same under the descending shower of water.

The advocates of this novel method of bath-construction claim the following chief advantages for it as against bath-houses fitted up with the usual form of bath-tubs:

1. The first outlay for construction is considerably reduced, because the douches are cheaper than bath-tubs. Likewise are the running expenses for maintenance and repairs reduced, because the apparatus is simple and not liable to get out of order, because douches last longer than copper or enamelled-iron bath-tubs, and because repairs, if needed for such baths, are not considerable in extent.

2. In public bathing-establishments the douche or rain-bath system is much more economical in management than the tub system, for the douche or shower-bath is always ready for use and requires but very little attendance. No time is lost as in the filling of the ordinary bath-tubs, and in the subsequent emptying, cleansing and scrubbing of the sides of the tub after each bath.

3. The douche or rain-bath, while more efficient, consumes less time in application, consequently a larger number of people can take baths in a given time than where bathing is carried on in tubs.

4. The rain-bath requires less space in the planning of a bath-house as compared with the same building when fitted up with bath-tubs. In other words, more bathers can be accommodated in a given space.

5. *The body of a person using a rain-bath does not come at all in contact with soiled-water*, as is the case in bathing in the ordinary bath-tub, for in the rain-bath the water from the douche passes away as waste-water through an outlet in the floor almost as fast as it is delivered. This is one of the leading arguments in favor of the new method, and it is of particular importance in the case of baths for workingmen or factory employés, of baths for school-children and of people's baths in tenement-districts.

6. The mechanical and tonic effect of the descending stream in the rain-bath is superior to the tub-bath, both in thoroughly cleansing the body and producing a stimulating effect and good hygienic results, whereas a bath taken in a common bath-tub instead of refreshing the body often has a debilitating effect.

7. The rain-bath requires somewhat less water than a tub-bath, which consideration is of importance where water is given to consumers by meter-measurement, which is generally the case in public baths and public institutions. The exact proportion between amount used in a tub-bath and amount needed for a rain-bath differs according to the construction, the number and the size of the perforations of the douche, the available water-pressure and the length of time during which the douche is kept running. The saving of water as quoted by Dr. Lassar and others appears to me to be somewhat exaggerated. Experiments by actual meter-measurement, carried out by the writer at the Demilt Dispensary, showed that whereas the tub-bath (a short French-shaped enamelled-iron tub) requires about 45 gallons, the rain-bath with an ordinary douche kept running for three minutes, requires about 22½ gallons (7½ gallons per minute), or in other words about one-half the amount required for a tub-bath. Three minutes for each bather is the time allowed in the case of military barracks in Germany: a workman or mechanic would in all probability, require the douche to run somewhat longer to effect a thorough cleansing of the body, hands and face after his work.[1]

8. Compared with swimming-baths the rain-bath affords a greater degree of privacy, and it can be used both in summer and in winter, whereas the free swimming-baths of many cities are only available during the summer-season.

9. Finally, the danger of communicating disease is somewhat reduced, because no impure, infectious or contagious matter is left in the bath, as might easily happen where the bath-attendant is either hasty or careless in the cleansing of the tub.

[1] Since writing the above, I have received some douches from Germany, such as are largely used there in rain-baths, and I find these douches considerably smaller in diameter and with holes less in number and less in diameter than used here. These douches run on an average from 2½ to 3 gallons of water, with a water-pressure of from 25 to 40 pounds per square inch.

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What appears to have been the first rain-bath was constructed as early as 1857 by Dr. Duval in a military barrack at Marseilles.

Dr. Alexander Bresgen, surgeon in the Prussian Army, in a pamphlet on baths published in Germany in 1871, was the first to advocate the general introduction of rain-baths instead of tub-baths for all public institutions, enumerating in particular military barracks, prisons, hospitals and factories. Attached to his pamphlet is a plan of an octagonal bath-house with sixteen bathing-apartments with overhead inclined douches, and he figures that 120 soldiers can bathe in one hour.

The celebrated French engineer and architect, Tollet, in a pamphlet published in 1877, and entitled "*La Reforme du Casernement et les Bains-douches*," Paris, 1877, submitted plans for three types of rain-baths suitable for military needs.

In the *Revue d'Hygiène* for 1879, Monsieur Vallin describes a primitive form of rain-bath used in an asylum for homeless women and children in Paris.

The first progress toward the general use of rain-baths was made in the case of military barracks and of prisons. At the suggestion of Dr. Munnich, surgeon-in-chief of the regiment, rain-baths were installed in 1879 in the armory of the Emperor Franz Joseph Regiment of the Guards in Berlin, his aim being to bathe quickly a large number of soldiers. Similar baths were fitted-up in the armory of the Infantry Regiment Prince George in Dresden, where twenty-four soldiers can bathe at one time in a large bath-room, also for a cavalry regiment of the Imperial Guards at Potsdam. In 1881, the military barracks of the First Bavarian Infantry Regiment at Munich, were furnished with rain-baths. The well-known military school at St. Cyr, France, was also equipped with these baths.

In Pettenkofer's "*Hand-book of Hygiene*," published in 1882, Prof. Dr. Schuster writing about military barracks, states that experiments with tub-baths for soldiers did not prove successful, first because the tubs are expensive, second because of the large quantity of warm water required, and third, because the time occupied in bathing is too great, and his conclusion is that the douche or rain-bath is much more adapted to the needs of the military service.

Again, for bathing in prisons, jails, workhouses and houses of correction, Dr. A. Baer, of Berlin, recommended in 1882, in the same hand-book, the douche or rain-bath in preference to tub-baths. He describes a prison or jail in the City of Muenster which has eight bathing-compartments fitted-up with douches, enabling the bathing of nearly 300 prisoners in four hours.

In the prison of Rouen, Dr. Merry-Delabost installed a large rain-bath capable of bathing 900 to 1,200 prisoners in two days.

The credit of having first advocated the use of the rain-bath for people's or public baths belongs to Dr. Oscar Lassar, who exhibited at the Hygienic Exhibition at Berlin, in 1883, the first people's rain-bath, the construction and equipment of which was carried out by the well-known firm of David Grove & Co.

The Berlin Health Exhibition in 1883, therefore, may be said to have given the first impulse to a more general introduction of this new form of bath, and Dr. Lassar since then became the champion advocate of public rain-baths in Germany. The matter received renewed vigor and impetus by the Berlin Exhibition for the Prevention of Accidents, in 1889, when a special committee arranged for a competition and drew up a programme for the proper construction and installation of workingmen's baths on the "rain-bath" principle.

Such people's rain-baths were built and constructed in Vienna in 1887, in Berlin, Frankfort, Magdeburg in 1888, in Munich and Hanover in 1889, in Altona, Breslau, Braunschweig, Mannheim and Mainz in 1890, in Würzburg in 1891, in Cologne, Düren and Mühlheim in 1892, in Leipsic in 1893 and, and are at present constantly and rapidly multiplying throughout Germany, whereas we hear little or nothing of their use in England or other European countries.

To Professor Flügge and Mayor Merkel of the university town of Göttingen belongs the credit of having advocated and introduced the first rain-baths into the public schools of that city. In public schools, where cleanliness of the body is so intimately connected with the problem of school-room ventilation, such rain-baths for the children have proven very successful, and the example of Göttingen was soon followed in other cities, notably Weimar, Sachsenhausen, Magdeburg, Karlsruhe, Mainz, Breslau, Frankfort, and others too numerous to mention.

Rain-baths were likewise soon erected or fitted-up in a great many factories and manufacturing establishments, of which I will only mention the large steel-works of Herr Friedrich Krupp in Essen.

Even on board of steam-ships the rain-bath has been found useful, and I learn that some of the ships of the German Navy, and likewise some of the fast, passenger ocean-steamers of the North German Lloyd are fitted-up with rain-baths.

Quite recently, rain-baths have been introduced into the United States, largely at the suggestion of a hydropathic physician, Dr. S. Baruch, of New York City, who had an opportunity to visit and inspect some of the European baths built on this principle.

The first American rain-bath was installed at the New York City Juvenile Asylum. Then followed the people's baths in Centre Market Place, the public baths at the Demilt Dispensary, in the Hebrew Institute, and those erected by the trustees of the Baron de Hirsch Fund at the corner of Henry and Market Streets in New York City. The plans and the construction of the three last-named baths were devised and superintended by the writer, associated with Messrs. Brunner & Tryon as architects. The writer also acted as consulting engineer for the rain-baths erected in the Young Men's Christian Association Building, at Cedar Rapids, Iowa, designed by Josselyn & Taylor, architects.

In Scranton, Pa., the Pennsylvania Oral High School Building is being provided with rain-baths from plans of Mr. Theophilus P. Chandler, Jr., of Philadelphia. The factory of J. H. Williams & Co., manufacturers of drop-forgings, in South Brooklyn, near Hamilton Ferry, has recently been fitted-up by its owner with rain-baths (although with vertical douches) for the employés.

At this writing a large bath-house is in course of construction, from plans prepared by the writer and under his superintendence, at the State Hospital for Insane at Utica, N. Y.

In this country the "rain-bath" is as yet comparatively little known, but its advantages are so obvious that the writer feels confident in predicting a rapid and successful development of the new form of baths. Since the opening of the Baron de Hirsch Fund Baths the writer has had numerous inquiries about rain-baths from Philadelphia, Chicago, Boston, Cleveland, and also from Southern cities, and he has learned that in Philadelphia the erection of a people's large rain-bath is now being contemplated.

It is sometimes argued that people's rain-baths cannot become popular in the United States because in all large cities and even in the smaller towns, dwelling-houses are rapidly built without the convenience of a bath-room. This can hardly be considered a fair statement of the existing conditions. The actual facts in the case would appear to me to be as follows: It is true that the wealthy and the well-to-do classes have in their houses one or several bath-rooms, fitted-up with more or less luxury, and the rich have, moreover, the many bathing-establishments charging a high price of admission, which only people in comfortable circumstances can afford to pay. On the other hand, it must not be overlooked that even in the houses of the well-to-do people proper provision is rarely made for servants' baths. Again, the middle classes who in New York City, for instance, are largely compelled to live in flats or apartment-houses (the higher-sounding name for improved tenement-houses), have, with rare exceptions, only a narrow, dark and generally uninviting bath-room, and the mistake is, moreover, usually made by architects or builders of locating the water-closet almost invariably in the same room. But the poorer classes of our population, including mechanics, salesmen, clerks, etc., have rarely any bathing facilities whatever, and there are thousands of tenement-houses, especially in the densely-populated districts of our large cities, which do not afford the convenience of a bath.

People's baths, therefore, would seem to me to be just as much needed here for health and cleanliness of the people as they are in Europe.

Rain-baths, however, are not merely suitable for public or people's bath-houses in populous districts. As their success in Europe has fully demonstrated, they are eminently adapted for many other classes of buildings, among which I will mention the following:

1. Institutions, such as general hospitals, hospitals for the insane, hospitals for infectious diseases, orphan asylums, prisons, institutions for feeble-minded children, for the blind, etc.
2. Gymnasiums, college buildings and club-houses.
3. Public schools.
4. Factories and manufacturing establishments, breweries, central slaughter-houses or abattoirs, etc.
5. Military barracks and armories.
6. Hotels.
7. Railroad stations, for railroad employés, in particular for the engineers and firemen, and the clerks of the railway mail-service.
8. Quarantine establishments.
9. On board of merchant steamships, ocean steamers and men-of-war.

The general arrangement of rain-baths as well as the details of construction vary, each case being a problem in itself. For whatever purpose they may be constructed, the baths should be tidy and neat, kept scrupulously clean and inviting in appearance, and well ventilated, heated and lighted. It will suffice to mention briefly a few of the more important features.

The main bath-room is sometimes divided into a dressing-room, and a separate room containing the douches, or else the dressing-rooms are arranged in a row on one side of the room, whereas the apartments containing the douches are placed on the opposite side. Such arrangement is preferred for schools, hospitals and military barracks. In the case of people's baths it is preferred to combine the dressing-room and the bath proper, separating the two only by means of a waterproof curtain. Each bath is generally four feet wide and four feet deep, whereas the dressing-room is four feet wide, and from three to five feet deep. The floor of the bath may consist of concrete covered with a final coat of pure Portland cement, or else some artificial stone floor, such as is used for sidewalks, is laid. The floor may also consist of marble mosaic or vitrified tiling, or else of asphalt, which is more impervious to water than cement, and is more agreeable to the feet than a cement floor. The cement floor is often covered in the dressing-room with a removable sectional wooden lattice, or gridiron-floor to keep the feet dry, but such wood soon rots and requires frequent renewal. In all cases the floor of the dressing-room should be graded toward the bath-apartment.

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In many rain-baths the floor of the bathing-apartment is sunk or depressed, being moulded in concrete in the form of a basin from four to six inches deep with rounded corners. In order to make the basin hold a few inches of water and thus answer for a foot-bath, the number of holes in the strainer over the waste is properly adjusted so that the water does not flow away as fast as delivered by the douche, or else a standing overflow with trumpet-shaped mouth is arranged.

It is not easy to decide what material is best adapted for the upright partitions or divisions between the bathing-apartments. A non-absorbent material, such as opaque and non-transparent glass, marble or slate would, of course, be best from a sanitary point-of-view, where economy is no object. The partitions may be covered with glazed tiles, and the walls may be tiled or faced with glazed or enamelled brick. Often the divisions are made of corrugated iron, galvanized and afterward painted with special bath-enamel paint. The cheapest partitions are those of wood, if well filled and oil-painted, and such I find are used in many of the people's baths in Germany, although they are undoubtedly inferior in point of cleanliness and durability to marble or slate. Sometimes marble divisions are used for the compartment and wooden divisions painted with English white enamel paint for the dressing-rooms.

The partitions should not be less than seven feet in height, and it is advisable to keep the bottom of all partitions from ten to sixteen inches from the floor to facilitate cleaning operations, and to promote the circulation of air.

The douches are made either of copper or of spun brass, and may be finished either by tinning or by nickel-plating. Copper douches are somewhat cheaper than brass, but they should be made very strong and have well soldered joints where the pressure of water is heavy, otherwise it may happen that the facing will blow out. It is preferable to have the face of the douche fastened with screws or bolts, so as to have the face removable in case the holes become stopped up by impurities in the water. The number and size of the holes should be calculated and adjusted to the available water-pressure so that the douches will deliver from 5 to 7½ gallons of water per minute. In order to be able to vary the angle of the descending stream it is best to fasten the douches to the supply-pipes by means of swivel joints. In order to enable each bather to control the douche, a strong self-closing cock with combination lever, chain and pull is inserted in the branch supplying each douche, and a hook is provided to fasten the chain to, in order to leave both hands of the bather free. Such cocks or shut-offs, may, however, be dispensed with whenever a bath-attendant controls the bathing-apparatus, as in schools, military barracks and institutions.

The water-service pipes, which are generally carried exposed along the ceiling of the apartments, may be more or less complex in arrangement. Sometimes both hot and cold water-pipes are provided and carried to each bath compartment, in which case each of the latter requires a separate mixing-valve, generally fitted with a hot-water thermometer. As a rule, however, the warm water of a temperature suitable for bathing and varying from 85° to 110° Fahrenheit, is mixed at a central apparatus, and carried and distributed to the douches by a single warm-water main. The best mean temperature of the warm water at the douche is about 100° Fahrenheit. Provision must be made by a large supply-pipe for an abundant supply of water.

Likewise should the waste-pipes from the bath be ample in size to carry off quickly all soiled water. The main drain should be laid with the greatest care, and wherever possible it is advisable to use a separate sewer for the bath-house where the same is located in a building having other plumbing work.

All plumbing should be durable and substantial, of the best of its kind and perfect from a sanitary point-of-view. A good flushing-rim water-closet with flushing-cistern, a well-flushed urinal, and a cleanly earthen or enamelled-iron slop-sink should always be provided. A hose sill-cock with rubber-lined hose, for flushing the floors and cleaning the bath-house generally, must not be forgotten.

Where a general waiting-room is provided, its floor should be tiled, and provided with a safely trapped floor-drain, with shut-off gate-valve.

The bath-house should be properly and comfortably heated and suitably ventilated. All bath-compartments should be lighted by gas, or better still by incandescent electric-lights.

The bathing-compartments should be fitted with plain and substantial furniture, as follows: In the bath proper there should be a perforated brass or galvanized-iron soap-cup and sometimes a wooden foot-stool or a galvanized-iron seat, while the dressing-room should have a well fastened hardwood seat, generally quarter-circle in shape, a number of enamelled-iron clothes-hooks, a towel-rack, a cuspadore and an iron boot-jack.

It is doubtful whether it is proper to provide comb and hair-brush in each dressing-room, because by the promiscuous use of these toilet articles diseases of the hair or scalp may be communicated from one person to another.

Mirrors in bathing-compartments generally become covered with watery vapor and are thus rendered practically useless, and it is quite sufficient to provide one large mirror in the main vestibule or hall of the bath-house.

The entrance from the waiting-room to the dressing-room should have a light wooden lattice door, cut off at bottom and at the top so as to admit of plenty of air for circulation. A door between the dressing-room and the bath-room proper is not needed; it generally suffices to put up a rubber curtain or a curtain of coarse cheese-cloth to prevent the splashing of the douche and the wetting of the clothes of the bather. It should be mentioned that physicians are opposed to the use of any curtain as being liable to take up and retain disease germs.

A question of prime importance in the construction and fitting-up of "rain-baths" is the provision of a large quantity of warm water, and, at least in the case of public baths, their ultimate success may be said to hinge largely about this point.

In private houses an abundant supply of hot water for bathing is, as a rule, provided for by the water-back in the kitchen range in connection with the kitchen boiler or reservoir for hot water. But for all large bathing-establishments special means for warming water are required, such as hot-water heaters with coal or gas fire, or else closed boiler-iron tanks heated by steam coils. Sometimes the water is heated by the direct admixture of steam, but this, as I shall explain later on, is a method not much to be commended.

Whatever the system may be, the warm-water apparatus to be successful should be simple, efficient and reliable; there should be no unnecessary loss of heat, and the water for baths should never become over-heated and thereby expose the bather to the danger of scalding.

In nearly all cases where a larger number of rain-baths are fitted-up, whether in bathing-houses, factories, institutions, schools, hotels, breweries or other buildings, a steam-boiler plant is erected in the building for heating or power purposes, and steam is therefore available for the generation of warm water in the form of either high or low pressure steam, or else of exhaust steam. The ordinary hot-water tank, however, heated by a steam coil, is open to many objections, being unreliable and difficult to regulate, therefore wasteful in heat. The Tobey hot-water heater is constructed with a view of obviating this difficulty and is, to some extent, successful. The ordinary hot-water tank has been fitted-up with an automatic attachment regulating the supply of steam. Both devices are, however, expensive and somewhat complicated.

Quite recently a novel and ingenious form of apparatus for heating water by steam has been devised which promises to work very successfully. About this I hope to say something in the near future.

WM. PAUL GERHARD.

SOCIETIES

YOUNG MEN'S CHRISTIAN ASSOCIATION, NEW YORK.

THE Library of the Young Men's Christian Association will give its sixth annual exhibition of art and architectural books on Washington's Birthday, from 11 A. M. to 5 P. M. The exhibition is designed more especially for students and for practical designers and architects. Both ladies and gentlemen will be welcome.

ILLUSTRATIONS

[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

OFFICES OF THE OAKLAND GAS AND HEAT COMPANY, OAKLAND, CAL. MESSRS. COXHEAD & COXHEAD, ARCHITECTS, SAN FRANCISCO, CAL.

[Gelatine Print, reversed, issued with the International and Imperial Editions only.]

This building cost about $45,000.

SIMSBURY FREE LIBRARY, SIMSBURY, CONN. MESSRS. HAPGOOD & HAPGOOD, ARCHITECTS, HARTFORD, CONN.

THIS library was given by Mr. Amos K. Eno to his native town. The building is of red brick with hollow walls. The outside is painted yellow with white trimmings; the outside doors, green. The plastering of inside walls and ceilings was tinted with buff Pecora stain before being put on, and was then floated. In one room the plastering froze, but set hard before being thawed, the result being that the surface is covered with imperishable Jack-Frost patterns. The inside woodwork is painted a creamy white, while the doors and railings are of mahogany. The upper doors are of pine painted dull green.

[*Note:* — Owing to the displacement of a negative and to the further fact that the drawing of the elevation of the building bore no title upon it, we published a portion of this plate last week as a presentation of a dwelling-house at Hartford. — EDS.]

ST. JOSEPH'S IN THE COURTYARD, WILLING'S LANE, PHILADELPHIA, PA. SKETCHED BY MR. FRANK HAYS, PHILADELPHIA, PA.

DOOR OF THE OLD CUSTOM-HOUSE, PORTSMOUTH, N. H. MEASURED AND DRAWN BY MESSRS. C. A. FOWLER AND F. A. CAMPBELL, BOSTON, MASS.

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SKELETON CONSTRUCTION AS USED IN THE NEW YORK LIFE BUILDING, CHICAGO, ILL. MESSRS. W. L. B. JENNY AND W. B. MUNDIE, ARCHITECTS.

For description, see elsewhere in this issue.

UNDER THE DOME OF THE ART BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL.

[Additional Illustrations in the International Edition.]

CHÂTEAU AT CLÈRES, NORMANDY, FRANCE.

[Copper-plate Photogravure.]

Because of the fortunately chosen position which the Château de Clères occupies in the midst of that pretty valley where the river slowly flows along, reflecting back the large trees upon its banks, we can judge fairly of the art and science with which our ancestors selected the sites where it was their pleasure to establish their seigniories. Here the Château de Clères, dominating four dales, and protected behind by a wide moat, was admirably placed from a strategical point-of-view. Like the Château de Longueville, which has left a very vivid fame in the annals of war, it overlooked the old road from Dieppe to Rouen, over which Joan of Arc passed, while being conducted from Beaurevoir to Arras, to Eu and to Dieppe, in order to be incarcerated in the castle at Rouen, and she must have stopped at this Château of Clères. This would only be another honor for the old Norman château, under the shadow of whose towers two kings, Charles IX and Henri IV once rested.

The ancient château appears to have existed in the immediate vicinity of the present building, behind the church. Its situation and the position of its principal tower seem to indicate that it must have overlooked a very old road descending towards the Village of Clères. Behind, it must have been protected by a moat and by the River Clères. The donjon, like many other structures of this epoch, amongst others the donjon of the Château at Gisors, was built upon an artificial mound. All the exterior of this ancient structure, which consisted chiefly of two stumpy round towers, was of *grès*. Under the tower of the neighboring church used to be a deep well. This ancient château was a contemporary of the château at Arques, and belongs to the thirteenth century. Midst its ruins, amongst burned beams, have been found fragments of a pavement bearing the fleur-de-lis and the towers of Castile. The destruction of the château must have dated from 1418, the time of the taking of Rouen by the English. George II, Sieur de Clères, who was made prisoner by the English at Harfleur, was at that time dispossessed of his property. The charter of Henry V, in fact, dated January 20, 1420, gave the lands and domains formerly belonging to Georges de Clères to John Gray of Heton, on condition of presenting himself at the camp at Rouen on St. John's Day with his following. This John Gray died at the battle of Beaugé, 1421. The estate passed to his son, Henry Gray, who owned it until 1431. This young lord, according to the notes "*Sur la Prise du Château de Rouen*" by Ricarville, also possessed the County of Tancarville, Beaunais, Hugleville and Gitre-Bernard, four estates which brought him in about seven hundred crowns of yearly income. The domain of Clères only returned to the possession of a French family with George III, son of John III, who also had been made prisoner by the English in 1419, and, on his father's death at the battle of Agincourt, had succeeded him.

It should not be believed that the old château was such a thing as is now presented by the ruins of to-day, covered with ivy. These old walls were, in fact, picturesquely restored in 1815 by M. Foucher, a sculptor of Rouen, and the model used to be in the cabinet of the Count of Béarn, who brought about the whole restoration of the château. It is easy to take account of the modifications, for all the restored portions are in the white stone of Vernon, while the ruins of the ancient parts are of *grès*. Near the ancient donjon is found the ensemble of all the structures connected with the château, formed by several buildings and sleeping-apartments connected together at right angles, forming two sides of an interior court — the *cour d'armes*. The château proper consists of two structures, which have undergone real restorations, greatly altering its appearance. One of them was, indeed, entirely reconstructed in 1865, in the style of the sixteenth century. The basement alone, flanked by short buttresses, existed on this side and was prolonged the length of the moat by a low wall in *grès*, as far as the old wine-press, which has now disappeared. The *corps de logis*, like the château itself, underwent modifications. As it existed in 1865, it seemed by reason of its construction to belong to the fourteenth century. Built of two stages of *grès*, on a square plan, under a pitched roof, its openings and bays, as was the case with numerous lordly dwellings, had to be made over into the style of the sixteenth century. At that time they enlarged the narrow windows and openings, and by successful treatment they decorated with sculptures the portions of the building thus modified, so that the ancient château gained all the appearance of a structure of that date. Upon the outside, upon the south side, this square building was in communication before the restoration of 1865 by a drawbridge, dropped over the moat by suspending chains. At this date there could still be perceived the slots through which worked the arms that supported the drawbridge. This drawbridge, which to-day has disappeared, gave access under an arched doorway opening under a low gallery, and dividing the ground-floor into two portions. The two stories above, upon the outside of the *cour d'armes*, were pierced with mullioned windows, those of the upper story terminated by a triangular crowning, surmounted by a bouquet and flanked by light pinnacles, enframing a frieze with bas-reliefs and sculptured monograms. Upon the south side there was added a little projecting stone gallery and balcony supported by decorated machicoulis. At one of the exterior angles of this old building is also found, sheltered under a carved canopy, a statuette of the Virgin, with the inscription "*Posuerunt me custodem.*" This statue facing the road, is also a modern addition, due to M. Foucher, the sculptor. The same may be said of the two lofty brick chimney-stacks, decorated at their summits with light arcadings in stone. They enclose, with a highly-decorative air, a dormer with carved gable, which is cut in the pitch of the roof.

On the interior, as we have said, the primitive *corps de logis* is divided on the ground-floor by a vaulted gallery, which upon the exterior opens into the *cour d'armes*. On the right, over vaulted cellars, is found the kitchen with its fireplace. Upon the left is a vaulted hall, which must have been the waiting-room of the common people. Access was had to the first story by an exterior turret placed in the *cour d'armes*, which we shall have to mention later, and which enclosed the staircase of honor. The grand vestibule on the first floor gave access to three rooms, the first, called the Chamber of Henri IV because of the sojourn which the Béarnese was said to have made there, occupies the angle of the building towards the village. It contains a hooded mantlepiece made over in the style of the sixteenth century, with panels and carved woodwork coming from the château, and a kind of cathedra or throne of modern make, constructed out of the fragments of carved wood of a square wooden drum, which came from the neighboring building, the *batiment de justice*. Here also is found an old bed. In his "*Dictionnaire d'Ameublement,*" M. Havard has published a drawing of this old drum, which is very curious. The second room, in the middle of this story, is occupied as a workroom, and the third is used as a dining-room. The second story, to which leads a minor staircase, situated in a little external hexagonal pavilion, contains several chambers.

To this structure joins another building, highly decorated, but entirely modern. The only piece of antiquity about it, on the *cour d'armes*, is the staircase tower, of which we have spoken, and even this was largely restored at the time of the restoration in 1862. It is built of *grès* on a hexagonal plan, and has its faces pierced with several moulded loopholes. It is crowned with a polygonal roof, slated, which is finished with a finial bearing a pennon. The doorway, formerly finished by a simple ogee arch, was at the time of the restoration richly and picturesquely ornamented. To-day it is approached by several steps leading to a platform carried on corbels, and decorated by a straight balustrade, with open flamboyant panels. The door itself, with elliptical head, the voussoirs of which rest on *culs-de-lampe*, in the guise of little angels, is enframed between two pinnacles, the shafts of which, twisted at their base, die away into pyramidal, crocketed pinnacles. The whole entrance, very picturesque, is sheltered by a triangular wooden canopy. In the tympanum which is sheltered by this canopy is a circular medallion consisting of a high-relief mask of a porter's head which projects from the surface of the wall which is decorated in polychrome with fleurs-de-lis and painted rinceaux. The general aspect of this entrance recalls one of the doors of the Château de Blois, which has also been reproduced in one of the houses on the Boulevard Malesherbes. Very curious and peculiar is the interior arrangement of the staircase, which is placed in this tower. This staircase *en vis de St. Gildas*, with solid newel, is built with its soffit supported on a series of arches, which form a vault. But what is peculiar in the way of construction, and especially in the way of stone-cutting, is the manner in which the lateral walls are connected with the intrados of the vault, bound together with a series of little brick triangles, admirably laid. An example of this kind of vault, which is very rare, may also be seen at the Château de St. Germain-en-Laye, as is noted by Souvageot, in his work "*Palais et Châteaux de France.*" The modern portion of the château consists of a square two-story building, with gables at either end, under a pitched roof, crowned with an openwork cresting in lead.

The façade facing the *cour d'armes* rises over a basement, pierced with two openings and decorated with bullets of *gres en bossage*, as at the Château de Dieppe. An ordonnance of four decorated windows, separated by loop-holes and narrow slits, marks the stories. The windows of the ground-floor in stone are mullioned with crocketed ogee heads. Those of the second story form dormers. These are square, and flanked by two pinnacles carried in projection, and enclosing a crocketed gable, whose tympanum is decorated with the armorial bearings of the lords of Clères. Beneath the roof's gutter, over which open the triangular wooden dormers, runs along the façade a wide band of brick and stone diaper-work. It is an arrangement which we also find at the Château de St. Maurice d'Etlan. Upon the roof, which is crowned with a leaden cresting, are detached two little cylindrical stone chimneys. The gable is of a very lively and interesting design. It is flanked by three buttresses whose slopes and vigorous profiles enliven the base. The middle one, which finishes in a pinnacle, supports the two upper windows, of which the lower part is protected by openwork balustrades.

At the level of the gutter runs above the gable a crenulated balcony, decorated with shallow panels of blind arcading. This balcony at each end abuts upon two vigorous angle corbels, supported by grotesque stooping figures, flanked with projecting gargoyles and

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crowned by a small pinnacle. Upon this balcony open two ogee-headed windows separated by the shaft of a very decorative chimney carried on a corbel, the stone pilasters of which enframe the brick-work which is broken by bands of stonework and a coping of open-work arcading. This chimney is very interesting, rising out of the triangular field of the gable, which is ornamented with a decoration of brick and stone diaper-work, which breaks up the monotony of the plain surface. The whole aspect of these ornamented chimneys recalls the curious chimneys of the Château de Martainville, near Rouen. The gable is finished with moulded stone corbie-steps like those in use in the old Flemish or Dutch houses. This entirely new portion of the château encloses, on the ground-floor, a large hall highly decorated, and upon the story above a series of chambers. The old portion of the château, as well as its modern addition, is connected with the different dependencies by a two-story structure of *grès*, pierced upon each face with two square mullioned windows, and on the ground-level by a wide passageway, which serves as entrance to the *cour d'armes*. This little building serves to connect the château proper with the Justice Building, and bears the name of "Passage des Hauts et Puissants Seigneurs." In this passageway used to be a flagging of varnished yellow and red tile, bearing the escutcheon of the lords of Clères, quartered with the arms of the lords Clères and de Brézé, allied to them. In this flagging, specimens of which are at the Museum of Antiquities at Rouen, was a third tile decorated in monochrome. Because of the difference of the level of the ground this "passage of the high and mighty lords" opened onto a narrow terrace, built on retaining-walls coped with stone and decorated with diaper-work of stone and brick. A narrow straight balustrade, with open-work panels, interrupted by pilasters, buts against a little turret in the form of a lantern, which contains a staircase, allowing access from the *cour d'armes* to the level of the terrace. This little lantern, built in the style of the sixteenth century, on a pillared base of diapered stone-work, was decorated with several open bays, and covered by a polygonal roof of the style of the little terrace of the Palais de Justice at Rouen, on the Rue St. Lo. It is here that an alarm-bell is placed. Upon this portion of the site is found the Justice Building, which consists of three stories of stone, pierced with square mullioned windows. At one of the extremities, towards the château, is found a half-turret with pepper-box roof, carried upon a crenellated semi-circular terrace, which contains the staircase leading from the first to the second story. In fact, to reach the first story of this building, it is necessary to ascend another staircase behind the Batiment des Communs and pass through a private vestibule. Upon the ground-floor this Justice Building encloses the grand hall of justice, where the lords came to give their decisions on disputes. The first story was occupied by two large tiled apartments, ornamented with wooden wainscotting. It is here that was found that wooden drum, which was utilized for the chair or throne which figures in the chamber of Henri IV. In the second story was the *chartrier*, which contained numerous abandoned rooms and the religious ornaments belonging to the oratory of the chapel. This oratory, which was independent of the seignioral chapel attached to the church, was placed in a narrow stone building attached to the Justice Building, and was finished with a sharp-pointed gable. This oratory, situated in the first story and enclosed by a wooden barrier, was placed above a vaulted passageway upon the ground-floor, which opens onto a little drawbridge, crossing the moat, connecting the terrace with the cemetery of the parish church, which was built behind. Next to the oratory, stretching along this elevated terrace, a few steps up, is the Batiment des Communs, in half-timbered work of the sixteenth century, the panels filled with variegated brick-work.

From its roof open two projecting dormers of wood. This building is to-day occupied as a coach-house and for servants' apartments. In the rooms of the first story there used to be painted landscape decorations, whose style seemed to indicate the time of Louis XIII. At the same date there could still be discerned there armorial bearings in azure on a silver chevron with three mallets. This building is finished behind by two polygonal brick and wooden towers, near which was found the old well. Beneath the building were vaulted cellars, which were attributed to the thirteenth century. Behind this building in a semicircular tower, overlooking the moat, is a wooden neweled staircase with stone bays, giving access to the first story.

Such is the Château de Clères, whose sixteenth century style recalls the sumptuous elegance of the Palais de Justice at Rouen, and, with its additions, it may be held to be one of the most beautiful structures in the region.

DETAIL OF THE PAVILION OF THE AMERICAN BELL TELEPHONE COMPANY, ELECTRICITY BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MESSRS. FEHMER & PAGE, ARCHITECTS, BOSTON, MASS.

[Gelatine Print.]

GROVE HOUSE, HARROGATE, ENG. MR. T. BUTLER WILSON, ARCHITECT, LEEDS, ENG.

THE new saloon is 34 feet in length and 22 feet in height, wherein on the right is a stone fireplace rising to the ceiling, consisting of an open hearth, fire-basket and ornamental dogs, over which is a moulded and enriched cornice supported by two caryatids taking the form of mermaids sculptured in Portland stone, from the studio of Mr. Frank Tory. The frieze is enriched by a representation of a hunting scene, while the whole is surmounted by Elizabethan pilasters and cornice. This apartment is lit by a stained-glass window, 11 feet by 7 feet, in nine panels, with subjects typical of mechanics, science and industry, conceived in a strong key of color, of bold outline; also by a panelled ceiling-light filled-in with rich glass-work from the studio of Messrs. Campbell, Smith & Co. A carved oak staircase rises to the first floor, from which level a gallery runs on two sides. The ceiling of the gallery is in enriched plaster-work, the walls have a panelled dado, and the doors are finished with moulded pediments. The whole of this work is carried out in fumed oak, the newels and other portions of the staircase and gallery being richly carved. The drawing-room is 34 feet by 20 feet, having a bay and two other windows to the south, with two fireplaces. This room is finished in dead white with polished mahogany doors, having enriched plaster frieze 2 feet in depth, which also crosses the room at the centre, and is supported by four Corinthian columns. The chintz bedroom has an ingle-nook fitted with settees upholstered in silks. The dressing-rooms are fitted throughout with baths and lavatories with tiled dados, Italian marbles and polished woods. The furniture throughout has been specially designed and made to meet the requirements of each apartment. The exterior elevations have been carried out in local sandstone, and made to tone in color with the stonework of the old house, and designed in harmony with the old work as far as the requirements would allow, the roofs being covered with red tiles. The new kitchen wing has received a somewhat lighter treatment, and half-timber gables have been freely introduced, the roof being again covered with red tiles. The expenditure in connection with this work has been over 31,000*l.*

HALTON, HERTS: FOOT OF GRAND STAIRCASE.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

THE CONSTRUCTIVE METHODS USED IN THE NEW YORK LIFE BUILDING, CHICAGO.

CHICAGO, December 9, 1893.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Referring to the following letter:

NEW ORLEANS, November 21, 1893.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Please ask Messrs. W. L. B. Jenney and W. B. Mundie to explain the reduction of live-loads from top to bottom, taken on columns of New York Life Insurance Building, Chicago, as described in your paper, No. 933, which I, for one, do not quite understand, and oblige, Yours, etc.,

(Signed) JAMES FRERET.

We beg leave to submit the following:

The reduction of the live-load on the columns in the different stories of a high building is made on the general assumption that the more stories there are above a column, the less will be the probability of all being loaded to their full capacity: and from this, the less will be the actual live-load per square foot for the total floor-area that comes on this column from all the stories above it.

The general transmission of the live-load is by the tile-arches to the floor-beams; by the floor-beams to the girders and by the girders to the columns. The floor-beams are designed to carry the highest probable load that will come on any one. The girders receiving their load through floor-beams numbering from two to six for each girder, it is impossible that every one of these will be loaded to its full capacity at the same time. Hence a reduction is made for the live-load on the girder from the live-load on the floor-beams. A column bears a similar relation to the girders resting on it that the girder bears to the beams; and it seems reasonable to assume a similar relation between a column and the columns above it. And on these assumptions the reductions for live-load on the columns have been made. It may be that the table of live-loads on columns, given in a previous article, does not express this clearly, but the arrangement of loads as shown in the table has been found convenient. The increase of live-loads on the basement columns is made on the assumption that the first floor is much more liable to be loaded to its full capacity on account of the use to which it is generally put.

As the construction of the steel-skeleton buildings has attracted considerable attention, both in this country and in Europe, it may not be uninteresting to some of your readers to present an isometrical view of the columns and the connections.

Figure 1. The work is all assembled at the building with hot rivets. It is necessary in these buildings to take care of the wind-pressure, which in this instance is in part provided for by the shape of the columns and the rigid channel-connections shown in Figure 2.

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Figure 3 shows the foundations of two columns where the situation was such as to force the foundations of the two columns to be united.

Chicago soil, it must be borne in mind, is a compressible clay of great depth that cannot well be loaded with more than 3,500 pounds to the square foot. The weights on the foundations must be carefully calculated throughout the entire building that the inevitable settlements of, say, about 3″ shall be uniform. The centre-of-gravity of the weights must be the centre-of-gravity of the figure of the footing on the clay.

Wherever practicable each pier and column has its own independent foundations. Occasionally they will crowd in such a manner

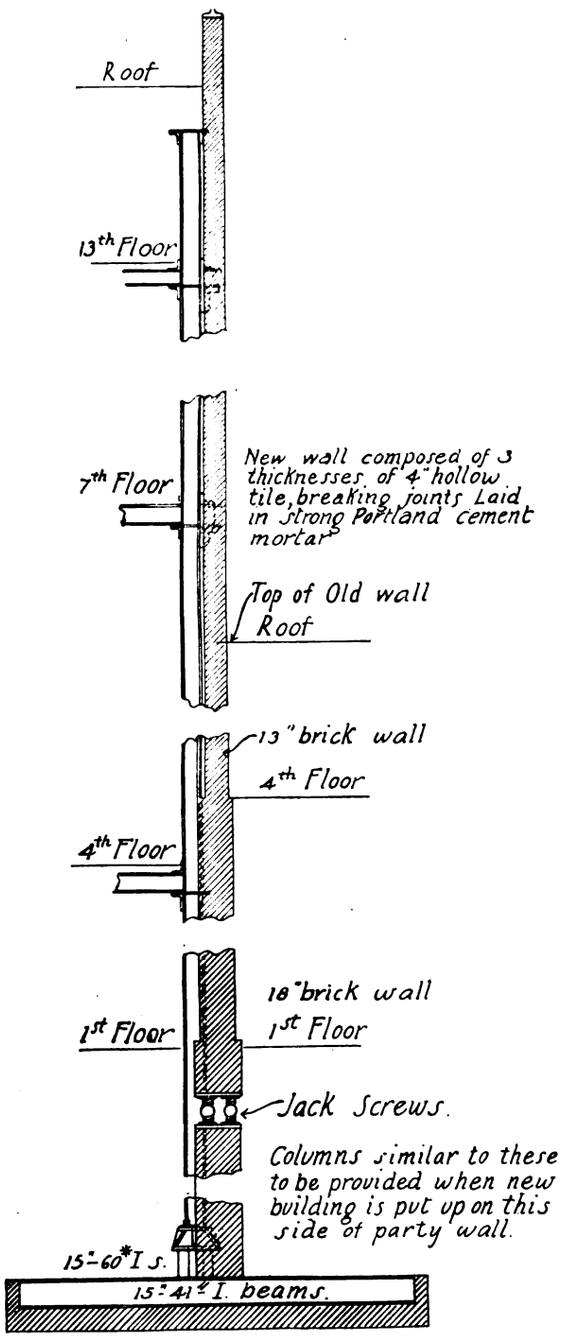


Fig. 1.

that two or more must be united, a sample of which is shown in the figure.

Party-walls. — It often arises that the new building joins another where it is impracticable to remove the old party-wall. This was the case in the New York Life Building — see Figure 1. The old wall was held up and new foundation put in to accommodate the new building and a possible future building adjacent of equal dimensions. As the supports under the old wall were taken out, jack-screws were inserted to keep the old wall in place during settlement of the new work. The floors of the new building were carried on columns, as shown.

A party-wall agreement provides "That when the party owning the property adjacent should desire to rebuild that they would carry their floors on columns and girders similar to those shown for the new building."

The "steel-skeleton" construction, now so universally used in Chicago for tall, fireproof buildings, offers great advantages in construction. The steel-work is set very rapidly, a story each twenty-five working hours. The exterior — each story being carried independently on the columns — can be put in wherever desired, and the floor-arches laid whenever a story is in place.

The view of the building from photograph taken while in process of construction shows the granite first and second stories set, but as the granite is invariably slow and the third-story granite was not at

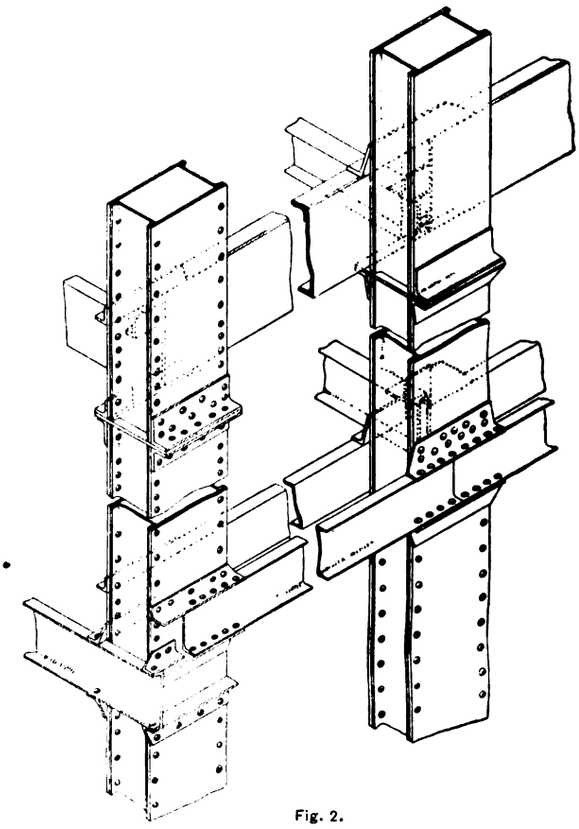


Fig. 2.

hand, the terra-cotta was set from the fifth story up, the granite of the third story and terra-cotta of the fourth to be filled-in later.

It can be readily seen, the advantages offered by this method of construction where it is so essential to complete a building ready for tenants in twelve months from the time of taking possession of the ground to the delivery of the building complete ready to receive the tenants, for it is usually the case that no move can be made to clear the site until old tenants are out on the first of May, and unless the

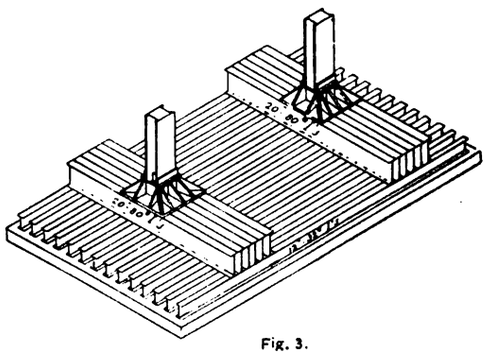


Fig. 3.

building is ready for new tenants on the first of May following, a very serious loss in interest is incurred.

It may be of interest to note the progress of the construction of the New York Life Building.

July 17, old building torn down to grade level: July 31, new footings laid out: August 17, Commenced setting basement-columns: August 31, commenced setting granite: September 5, commenced setting tile-arches: September 18, commenced setting terra-cotta: September 29, all steel-work set: November 9, finished setting tile floor: November 11, finished setting terra-cotta: November 12, commenced plastering: December 2, turned steam on in building from the entire and completed steam plant: December 4, commenced the white hard-finishing coat of the plastering.

Building is expected to be ready for tenants April 1, 1894.

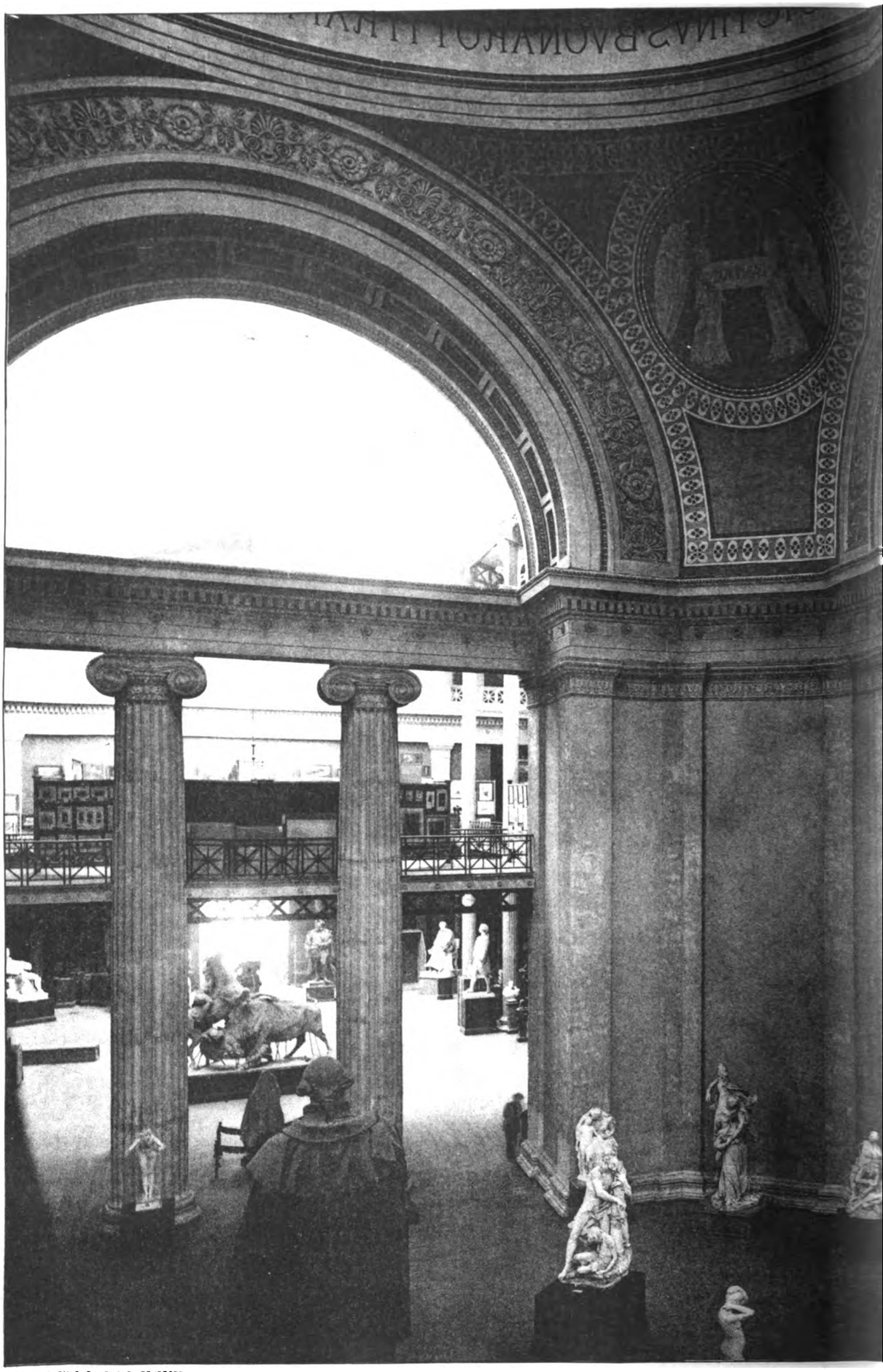
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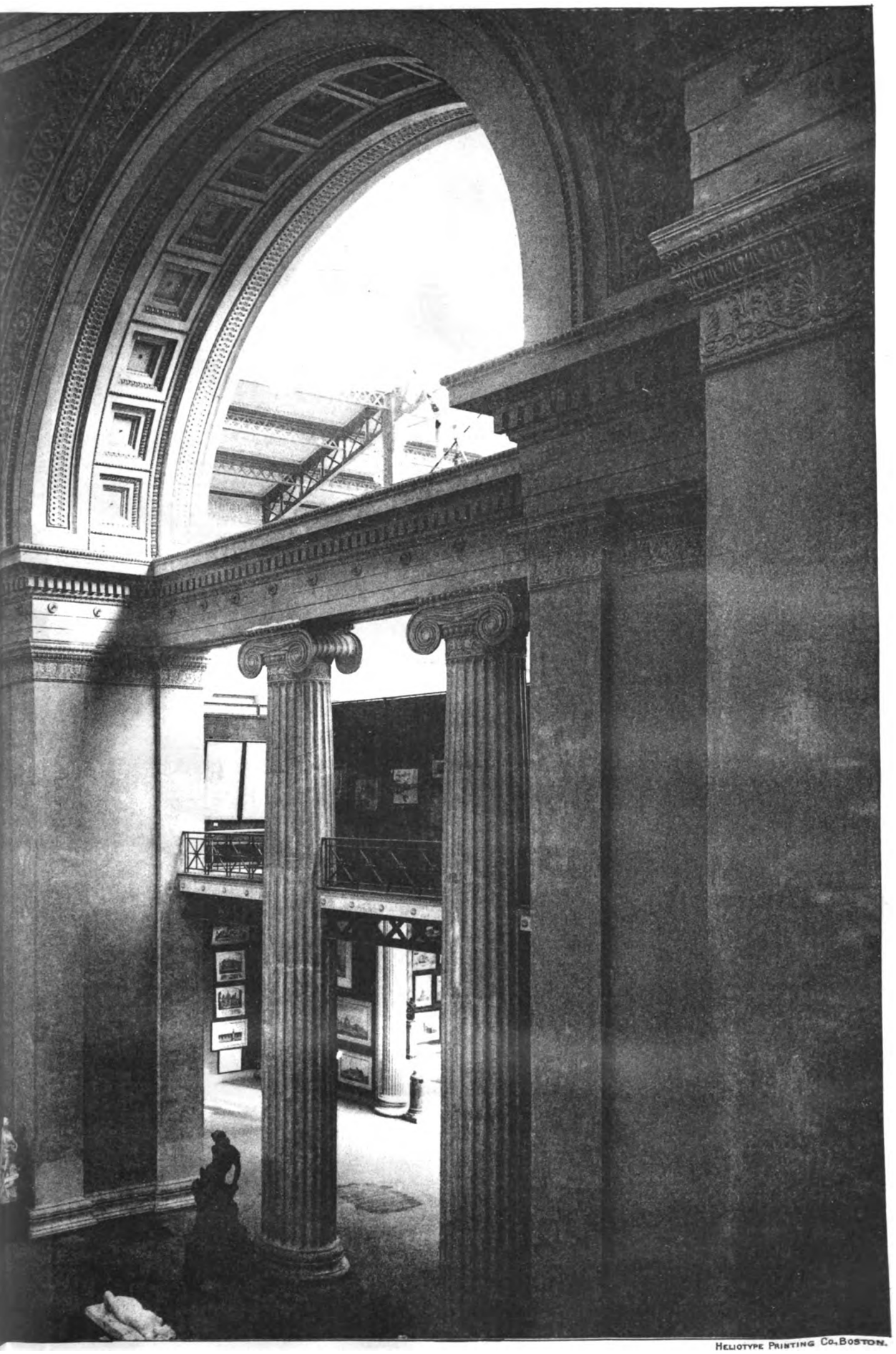


NEGATIVE BY C. D. ARNOLD, REVERSED

UNDER THE DOME
WORLD'S COLUMBIAN EX
CHARLES B.

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AMERICAN ARCHITECT & BUILDING NEWS CO.



HELIOTYPE PRINTING CO., BOSTON.

OF THE ART GALLERY.

EXHIBITION, CHICAGO, ILLINOIS.

ATWOOD, Architect.

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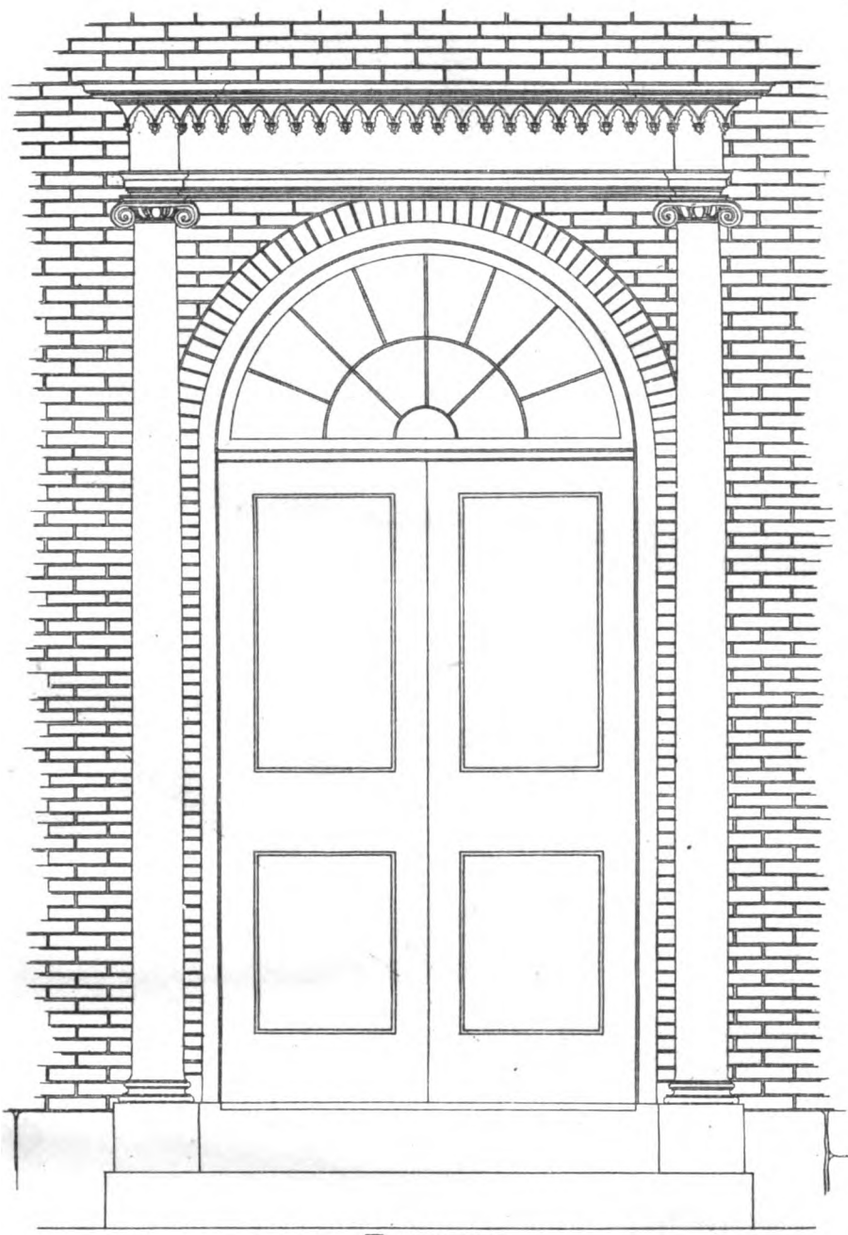
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DOORWAY

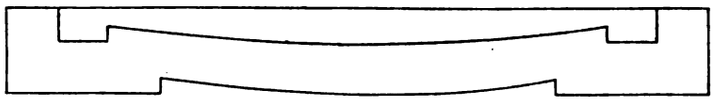
OLD CUSTOM HOUSE

PORTSMOUTH N.H.

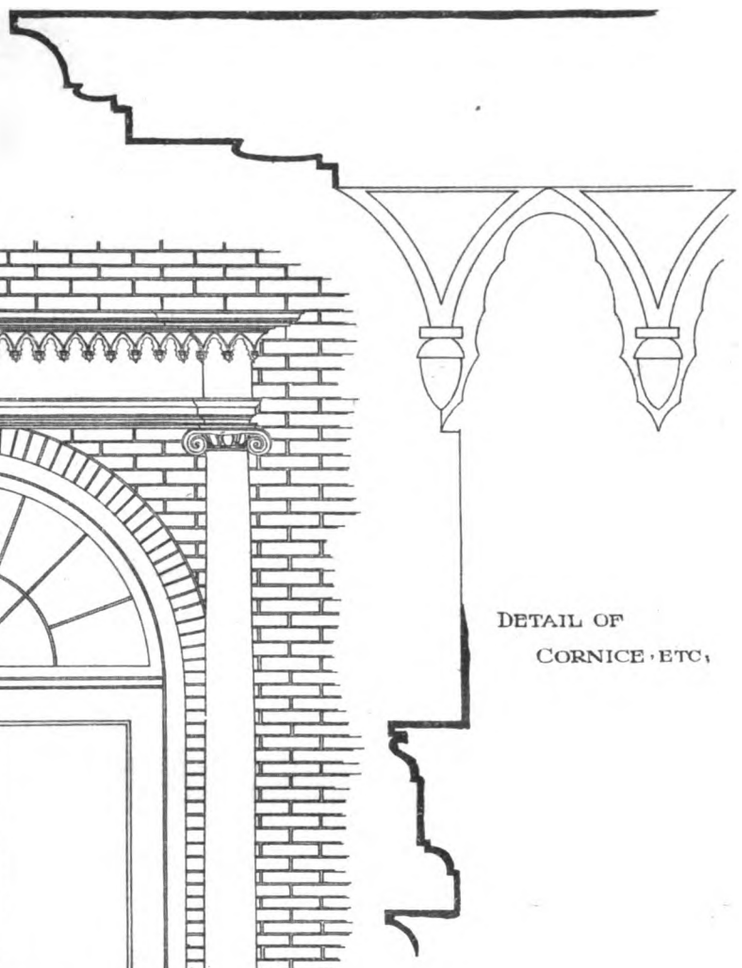
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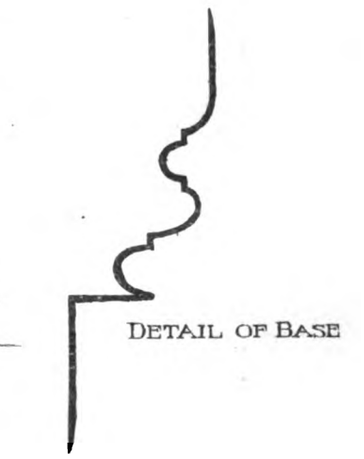
ELEVATION



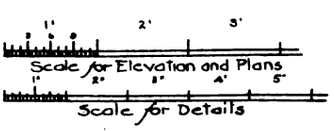
PLANS OF FRIEZE AND CORNICE



DETAIL OF CORNICE, ETC.



DETAIL OF BASE



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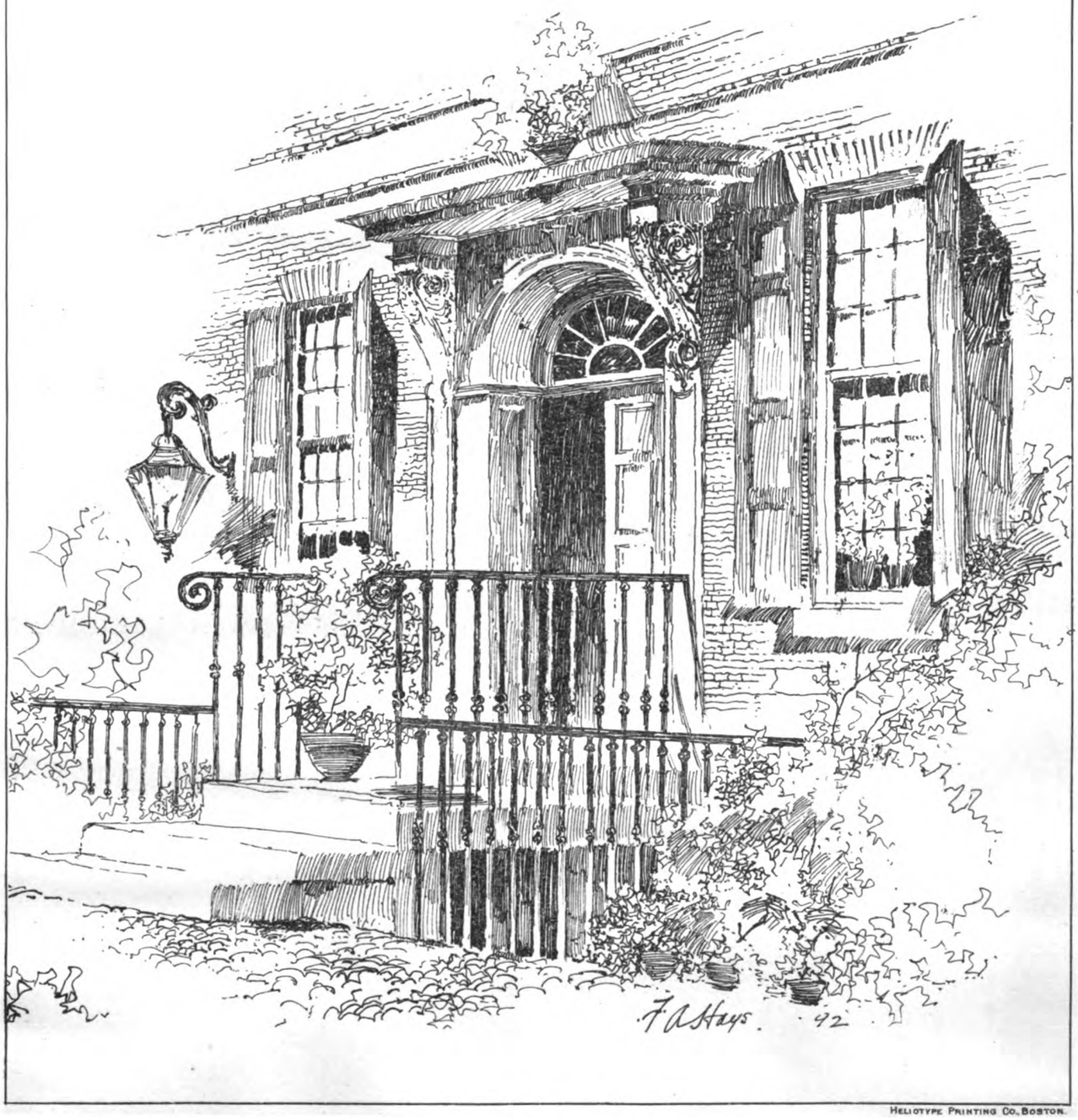
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St. Joseph's
in the
·COURTYARD·
Willing's Alley
Philada-

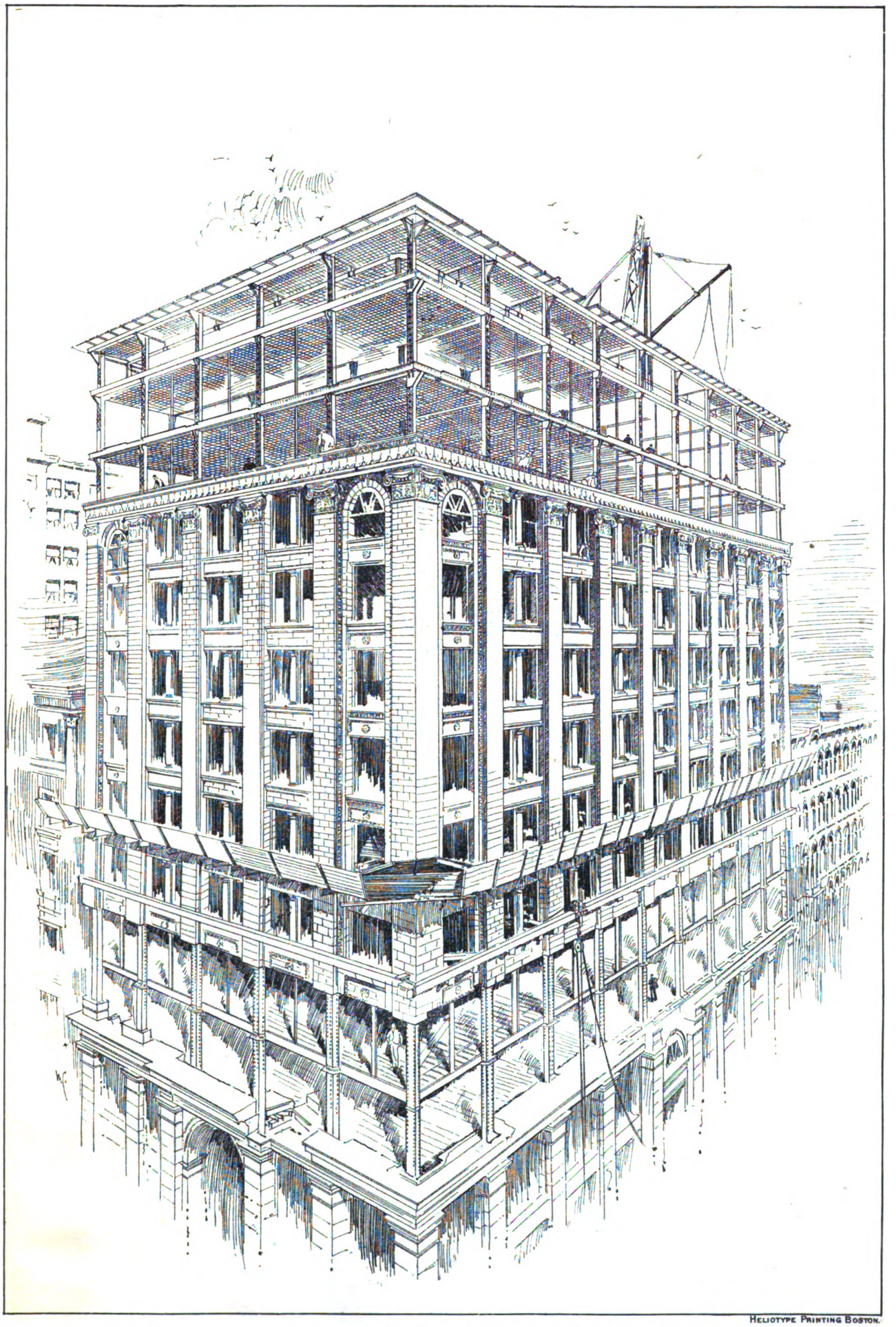


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SKELETON CONSTRUCTION AS USED ON THE NEW YORK LIFE BUILDING, CHICAGO, ILL.

W. L. B. JENNEY and W. B. MUNDIE, Architects.

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THE New York *Times* has a candidate for the office of Supervising Architect of the Treasury Department, in the person of Mr. D. H. Burnham, who, as it hopes, might make the great sacrifice of income which would be necessary, for the sake of the services that he could render to art in that capacity. It is in the highest degree improbable that Mr. Burnham would abandon a position at, or near, the very head of the profession in this country, with an income which is said to be nearly a hundred thousand dollars a year, to become a mere routine official, whom a political exigency, or the caprice of a superior, might at any moment send back to private life. However great may be the mutual esteem between the Supervising Architect and the rest of the profession, and, with some incumbents of the office, this reciprocal regard has been most honorable to both parties — the official architect of the Treasury, being an official, must give up the initiative, the exercise of his own imagination, and control of his design, which alone entitle a man to a place among artists; and we are sure that Mr. Burnham would never surrender these. Nor can we see how art would be much the gainer if he should do so. Undoubtedly, it would be a fine thing for the pocket of the public if it could hire an architect so brilliant and accomplished for a salary about half as large as that which he pays his own principal clerks; but the public idea of what the services of architects are worth differs already quite widely enough from that entertained by the profession, without being confirmed by the spectacle of one of the most conspicuous modern masters of the greatest of the arts bustling about the Government plan-factory, at the behest of Senators and Representatives, for a salary probably inferior to that of the White House cook.

MR. JOHN ORD, who succeeded the late Mr. McArthur as architect of the Philadelphia Public Building, has had an unfortunate misunderstanding with the Public Building Commission, which has not only a certain interest for his friends in the profession, but seems to convey a lesson to other architects who may be employed on public work. So far as we can gather from the Philadelphia papers, the history of the case appears to be that the Public Building Commission, in making out their usual estimate of the amount of the appropriation required for the building for the next year, inserted an item for the salary of the architect, fixing it at $4,000 instead of the $7,500 which had been previously paid him, and omitting the usual provision for an assistant for him, and a clerk for the President. Before this was acted upon, or, possibly, before it was presented to the City Council, one of the members of the Finance Committee of the Council went to Mr. Ord in a great hurry, and said that the Finance Committee was about to meet, or had already met, and wanted a statement of what money would be required for the City Building. Whether Mr. Ord knew that any estimate had been prepared by the Commission is doubtful, and, to the request of the Finance Committee he replied, very properly, that it was out of his province to make such estimates, and that the Commissioners alone were authorized to do so. None of the Commissioners, however, were within reach, and Mr. Ord finally made, under protest, a very hurried estimate, including, as had been usual in previous estimates, his own salary at $7,500, with $1,500 for a draughtsman and $1,200 for the clerk to the President of the Commission. No objection was made by any one to the estimate for some time, but two or three weeks afterward, one of the Commissioners, with another city official, came into the office of the Commission, saying that the whole appropriation was in danger, because of these items, and that they must be changed. The indications appear to be that, in the meantime, the Commission's estimate had reached the Finance Committee, and that the discrepancy between it and Mr. Ord's estimate had attracted unfavorable notice. However that may be, the matter was referred to the Secretary of the Commission, who revised the draft, reducing the architect's salary to $4,000, and omitting the items for the draughtsman and clerk. On its way back to the Council, however, it seems to have undergone another transformation, the items for draughtsman and clerk having been restored, but that for architect's salary left unchanged; and in this form it was accepted by the Council, and the order making the appropriation passed in accordance with it.

THE next person to concern himself with the matter was the Controller, who, on comparing the appropriation with the original estimate of the Commission, found a discrepancy, in the items for draughtsman and clerk, and sent to the Commission for an explanation. The Commission appear to have learned then, for the first time, that Mr. Ord had made an estimate, including these items, as well as a larger salary for himself than the one they had fixed; and those who know the strictness with which public officers are held to their financial proceedings, and the jealousy with which they regard any attempt to infringe their prerogative, can imagine their wrath at what they presumed to be Mr. Ord's unwarranted tampering with their estimate. As the architect of the building is elected from year to year, and Mr. Ord's last term had already expired, there was no need of dismissing him, but the Commission, as a mark of its displeasure, immediately elected, in his place, Mr. John T. Windrim, the son of the Commissioner of Public Works. Even this was not the end of the matter, for Mr. Windrim promptly declined the appointment, and the place was finally accepted by Mr. W. B. Powel.

MR. R. M. HUNT has received the distinguished honor of promotion from the rank of Corresponding Member of the Institute of France to that of Associate. Very few foreign architects, and still fewer Americans, ever reach this distinction, the highest that France can offer as a reward for artistic work. The whole profession in this country will rejoice in Mr. Hunt's honors.

THE artistic passion for the nude which possesses Mr. Kenyon Cox and Mr. St. Gaudens seems to have brought more trouble upon the latter. Hardly had the newspaper controversy over the Columbian medal subsided when one of the Boston daily papers discovered that two persons shockingly in need of apparel were represented in the sculpture which adorns the front of the new Public Library. It is needless to say that it made its discovery known to everybody who was willing to give one cent for the privilege of reading about it, and the other papers lost no time in affording opportunities for persons, with two cents to spare, to study

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the matter under aspects varying according to circumstances. As might have been expected, the papers with an artistic or literary reputation to support took the ground that the naked figures over the Library door were quite proper, and that those who objected to them only did so because of their own evil thoughts; while the representatives of the everyday people maintained that the figures were, in such a situation, offensive and improper. The City Council, after viewing the premises, took the latter view, and voted unanimously to have the sculpture changed; but, as the sole control of the building is, for the present, in the hands of the Trustees, it is not very evident how the Council can carry its ideas of propriety into execution. Meanwhile, we are ourselves inclined to side with the City Council. It may be, as the champions of art say, that the objection which other people feel to Mr. St. Gaudens's figures proceeds from evil thoughts, from which they are themselves free; but it certainly does not follow, because a large portion of mankind is liable to have evil thoughts suggested by such objects, that it is desirable to place them in public places. Apart from the matter of evil thoughts, however, we doubt very much, and have doubted for some time whether the nude figures do not detract from the beauty of the Library front. Whatever may be said of the beauty of the unclothed human form, there is no question that its dignity, as well as its appropriateness as an architectural decoration, is enhanced by drapery. Michael Angelo once painted a picture, in which, to display his knowledge of anatomy, he showed a great number of naked figures; and to this day the picture is known by the name that his contemporaries gave it, as the "Hash of Frogs." Certainly, it was not the dignity of the composition which won for it that name; and if the froggy portions of the Library façade should be chiselled away, in deference to the modesty of the City Council, we are disposed to believe that the general effect of the composition would be decidedly improved.

AT the Eighth Annual Convention of the National Association of Builders, held in Boston this week, several things of general interest transpired, and we regret not to be able to give more space to a discussion of them. In the first place, in his welcoming address, Mayor Matthews took occasion to inform his hearers that neither visitor nor resident need have any fear that the Boston Public Library would be transformed from "a monument of art to a monument of folly" by the carrying out of the recommendation of the Common Council, to which we refer above. In the next place, President Hersey's annual address laid a good deal of stress on two important matters, one that the attack of the trades-unions on the apprenticeship system should be nullified by fostering the growth of trade-schools; the other, that all difficulties between master and man, and between one contractor and another, should invariably be submitted to arbitration under a properly organized and generally recognized system. Hon. Carroll D. Wright, in his address, also devoted himself to the discussion of the latter question, showing that, to be beneficial and enduring, the system of arbitration adopted must, so far as possible, ensure mutuality of benefit. Later in the session a "form of arbitration" was unanimously adopted, which runs to the effect that the two organizations to which the employers and employés respectively belong bind themselves to submit all matters of mutual concern to a joint committee and agree to abide in every case by the decision by them given; that neither strike nor lockout may be adopted by either party, and that all questions shall be settled by the members of that trade alone whose interests are affected by the question at issue.

APROPOS of another resolution that was reported, it occurs to us to make a suggestion. This resolution looks to a change in the constitution and by-laws, by which biennial may be substituted for annual meetings. A similar suggestion has been more than once made as to the conventions of the American Institute of Architects, the reason for the proposed changes presumably being the same in each case. Now, if the architects and the master-builders could hold biennial conventions, arranged so as to fall on alternate years, and if the officials of one organization could regularly attend the meeting of the other organization in an official capacity, with the privilege of the floor when matters come before the meeting on which it was desirable to have both sides of a question properly and officially presented, we believe that in a short time many of the causes of complaint, which on one side or the other now exist, would be removed, since they exist largely as relics of antiquated methods or because of some misconception which could and ought to be explained away. Thus at the convention this week sundry resolutions were introduced, asking that steps should be taken to ask architects to do this, that or the other in a way different from their present methods, the changes being presumably for the benefit of the builders, no matter how they might affect the architects or their clients, and if the architects had had official representatives present the impossibility of making the change could have been at once clearly stated; or in the other case they could have had explained to them how hard the present practice bore on the builders and how simply a beneficial change could be made. We think this suggestion is both good and practicable, and altogether in harmony with the general tendency of the times, which is everywhere seeking to eliminate friction and promote harmony and confidence in all who are so closely allied as are architects, master-builders and mechanics.

LA REVUE INDUSTRIELLE gives some further particulars in regard to the experiments of M. Raoul Pictet on the resistence of animals to extreme cold. It will be remembered that M. Pictet froze microbes in a lump of solidified atmospheric air, at a temperature of about 323° below the Fahrenheit zero, and found that, when thawed out, they were as lively as ever. It seems that, besides bacteria, he has exposed diatoms, spores, micrococci, and certain tiny seeds to the same intense cold, and has found in all cases, that after being thawed out, they carried on their vital processes as actively as if they had had no unfavorable experience. The microscopic spores produced their usual series of bacilli; the diatoms sent out their threads of gelatinous protoplasm; and the seeds germinated and sent out vigorous little plants. Among the organized ferments, the ptomaines and the vaccine virus alone were found to be affected by this degree of cold, the vaccine virus becoming sterile. In the same way as the seeds and germs of tiny plants, the eggs of animals of a similar rank in the scale of development defy, we are told, the most intense cold yet produced. Unfortunately, the precise animals to whom the eggs belonged is not specified, but we know that the eggs of moths, even of large and highly organized varieties, are exposed all winter on the bare trunks of trees, to the utmost rigor of our terrestrial climate, without the slightest injury, so it is conceivable that those of microscopic creatures might bear a far greater degree of cold. M. Pictet, who appears to be something of a speculative as well as an experimental philosopher, is rather perplexed by these discoveries. He has found that all chemical reaction ceases at a temperature of about 150° below the Fahrenheit zero, so that the chemical theory, according to which vitality is the effect of oxidation, fails to account for the persistent life of the little organisms; and he takes refuge in the explanation that "Life is a manifestation of the laws of Nature, like gravitation." He considers that, like force, life cannot be destroyed, but is always ready to manifest itself whenever it finds a suitable organization through which it can act. "If," he says, "one could make a complete organized structure out of lifeless matter, the physico-chemical conditions would be sufficient to develop in it all the vital phenomena of vegetative life." This is rather an extensive induction from the observation that germs and eggs resist extreme cold, and M. Pictet himself qualifies it by saying that phenomena of a psychical order can neither be produced nor explained by the mere movement of organized matter; but he does not specify where the line between vital and psychical phenomena is to be drawn.

EVERY one will regret to hear that the Fine Arts Building at Chicago, the only one of the great palaces of the White City which was intended to be permanent, has been examined by the Underwriters, and pronounced unfit to receive the exhibits which it has been intended to place there, and which are valued at about three million dollars. Whether the building will be reconstructed, or removed, to make way for a new one, remains to be seen, but it would be a pity to lose entirely one of the most beautiful of the structures that have for the past year glorified Jackson Park.

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OFFICE-HELP FOR ARCHITECTS.[1]—XXV.

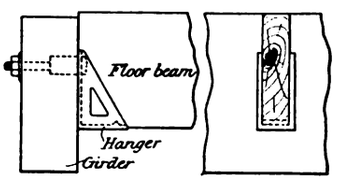


Fig. 122.

§ 319. Miscellaneous Points: *Regular Framing:* — Sills should always be set in a bed of freshly spread mortar and well tamped on it.

For regular framing, all joints should be tenoned and tree-nailed. All girts, girders, etc., should be wrought from solid stuff with the bottom third of the depth free from knots or other imperfections. Notches on the under side of girders and beams when they rest on walls, posts, etc., should never extend more than one-sixth of the total depth of the piece. Beams should be framed to girders either with a Duplex Hanger (Fig. 122), or onto a $2'' \times 3''$ strip spiked to the side of the girder. Girders should be framed to columns, either on an oak cap placed between the column bents, to a bracket bolted to the side of the column, or to a Goetz-Mitchell or Duvinage column cap. (See Fig. 50.)

Balloon-Framing: — Use plenty of spikes and nails; bring all parts closely together. Floor-beams should be carefully tied across all partitions so as to make ties across the building. All girders should be brought to studs which carry down to the sill. See that all bearings are of the full area intended as there will otherwise be a tremor from the framing in the floors. Framing timber is very cheap and it is a foolish policy to try to save a few hundred feet. Use a $2'' \times 4''$ or a $2'' \times 6''$ as a unit and make all larger sizes needed, so long as they do not exceed the depth of the material, by building up with pieces of this size, spiking them together. In the same way make all girders of the floor-beams placed side by side and well spiked together. When girders are so made they should be covered on the top side with $\frac{1}{8}''$ stuff, tarred-felt or building-paper until the roof is on, to exclude the moisture as far as possible.

§ 320. Outside Coverings: — These are of two general classes; clapboards or shingles. They may be put on over sheathing-lath or on the studs.

Clapboards or weather-boards are of two kinds, bevel siding and novelty siding (See Fig. 123). The better is the novelty siding put directly on the sheathing with building-felt put 18″ wide around all openings, this in connection with the Byrkit-Hall sheathing, back-plastered, gives the tightest possible wall. For the sheathing, use any heavy building-paper. Cabot's sheathing-quilt may be used, but it does not aid in fireproofing. Felt should be tacked on so as to lap 6″ over the free edge of the opening, and when the frame is set there is some chance of its being tight. Bevel siding may be used in the same way, but then the entire side should be covered with the building-felt. All siding should be furnished clear, free from all knots, bark or stains. Joints should be butt-joints and should not occur oftener than once in four courses. They should be made by dipping the ends in white lead; they are then brought over a stud and nailed with two nails in each butt. For mill-construction $2'' \times 10''$ novelty siding, dressed two sides, may be used, eliminating all voids.

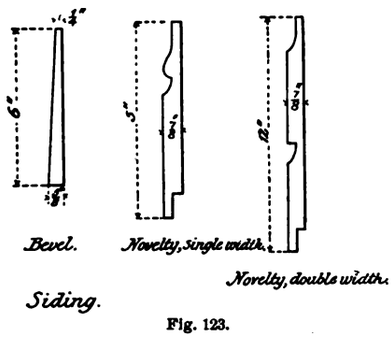


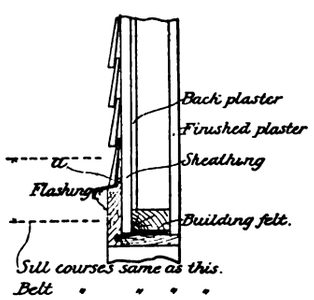
Fig. 123.

Shingles: — Shingles may be either pine, white cedar, cypress, red wood or white wood. Cedar have the best color and cypress or red wood are the most enduring: shingles split from the log are better than those that are sawed. Sizes range from about 4″ wide and 18″ long to 8″ wide and 30″ long. On side walls they may show to the weather one-third of their length and on roofs should show one-third length less $1\frac{1}{2}''$.

Bunch shingles of pine or cedar are usually of irregular widths and are bundled up often before they are thoroughly dried; they should, therefore, be opened at least ten hours before being taken to the scaffold to be put on. They should be nailed with at least one galvanized-iron nail for each $2\frac{1}{2}''$ of width, and tightly driven up to one another.

Shingles should be left to stain with the weather, or else be dipped for at least two-thirds of their length in "Cabot's creosote stain." The effect of the stain is usually deepened by time for all but some of the very dark stains verging on the gray, and for these the effect is lightened by time. Shingles may be put on either by nailing to the sheathing or else by being nailed to spruce laths $1\frac{1}{4}'' \times 2''$, put on about 6″, *c* to *c*, or the amount of the exposure of the shingles to the weather. While it is bad practice to put the side shingle on lath, as the sheathing gives a very necessary amount of strength and stiffness and warmth to a house, it is the best practice for the roof. All shingling should begin with three butts, well nailed through the ends; all other shingling where there is 7″ or less to the weather should have the nailing concealed. All hips, ridges and external angles should have the shingling doubled.

§ 321. Flashing: — Flashing is vitally important. A stamped and well-known brand of terne plate made by a reputable maker, or copper should be used in the city, and copper or zinc in the country. Tin should always be painted on both sides before using. Flashing should generally be made double, with the under flashing carried up at least 16″ and the upper flashing turning down 6″ over it. All belt and sill courses, window-heads and the like should be flashed, although the flashing cannot go higher than 6″. (Fig. 124.)



§ 322. Composite Walls: — Walls made with a timber frame and stone, or plaster, or concrete filling are sometimes built for the effect. They can be built successfully sometimes but will usually result in great cracks that must be repointed after the seasoning is completed. Where the effect is necessary, the writer believes that the best practice would be to use a full frame-house with the spaces between the frame filled with "Curran's grooved plaster slab" or "Byrkit's sheathing," plastered with about $\frac{3}{4}''$ of Portland cement and sand, equal

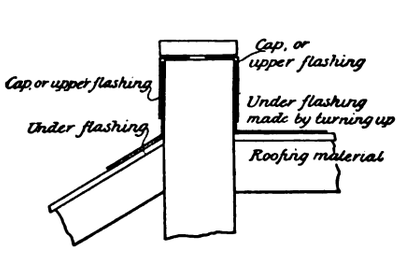


Fig. 124.

[1] By George Hill, Consulting Engineer. Continued from No. 944, page 41.

ABBREVIATIONS AND SYMBOLS.

= equal to.	∴ therefore.
∥ parallel to.	□′ square feet.
÷ divided by.	□″ square inches.
× multiplied by.	8# read 8 pounds per lineal foot.
+ added to.	[channel bar.
a^2 *a* multiplied by itself.	I I-beam.
$a > b$: — *a* greater than *b*.	T T-iron.
$a < b$: — *a* less than *b*.	L angle iron.
$\frac{a}{b}$: — *a* divided by *b*.	I deck beam.
	● round section.

I ton = 2,000 pounds as this is the conventional ton, the legal ton is 2,240 pounds, but is rarely used.
l = the length between supports of any beam or girder or height of any column, always in feet.
b = breadth of any beam or girder, always in inches.
d = depth of any beam or girder, or the least transverse dimension of any column, always in inches.
L = total load uniformly distributed coming on any piece in pounds.
Lw = " " " " " per square foot in pounds.
W = concentrated load on any piece in pounds.
s = span of any arch or truss between centres of end pins in feet, or spread of footing courses.
A = area of any section in square inches.
M = maximum bending-moment in inch pounds.
n = distance of centre of gravity of section from either top or bottom edge in inches.
I = moment of inertia, neutral axis through centre of gravity.
R = moment of resistance of section.
r = radius of gyration, in inches.
Sc = safe compressive strain in pounds per square inch.
St = " tensile " " " " " "
Ss = " shearing " " " " " "
S = strain per square inch in extreme fibre.
P_e = upward reaction of support at left-hand end of beam.
P_f = " " " " " right " " " "
e = distance of centre of gravity of load from left hand of beam.
f = " " " " " " " " right " " "

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parts, or hard plaster. The frame should be so laid out as to carry off all water flowing down the front and keep it from lodging in the joints and behind any of the framing. If this is too costly, then the wood frame should be only a sham dividing the front inch of a solid concrete wall into small spaces. In any case the danger from frost is very great and must be carefully guarded against.

(To be continued.)

WHAT BUILDINGS COST PER CUBIC FOOT.

WITH materials and labor at the same price, two buildings of the same character, although of different sizes, will be found to cost approximately the same per cubic foot; hence the cost of a proposed building may be quite closely estimated by multiplying its cubic contents by the known cost per cubic foot of a similar structure built in the same locality. Any general change in the price of materials and labor would of course affect the cost per cubic foot in the same ratio.

Unfortunately, when one wishes to estimate the cost of a proposed building in this way, especially if he has been practising but a short time, he is generally unable to ascertain what price similar buildings have cost per cubic foot, or else is put to considerable trouble to determine it.

To remedy this inconvenience the writer has undertaken to compile a list of representative buildings, giving the price which they cost per cubic foot. Owing to the reluctance of owners to have the cost of their buildings made public, the writer has found his task rather a difficult one, but through the kindness of several architects he has been able to obtain the necessary data for a sufficient number of buildings in different localities to give a pretty fair idea of the cost of the usual class of buildings. In some cases the cost was not furnished by the owner or architect, and wherever the word "*about*" is used it is to be understood that such was the case, although the variation from the exact cost is probably very slight. In most cases and particularly those marked by an asterisk, the cost does not include the architect's fees.

In preparing such a table it is difficult to make an absolutely fair comparison on account of the difference in the style of the building and the method of computing the cubic contents. When it was known, the way in which the cubic contents was measured is stated: in the buildings designed by Mr. R. W. Gibson, the cubic contents was computed usually from the basement floor or if there was a cellar, from half the depth of the cellar. At the top the limit was taken at the top of a flat roof, or half-way up a sloping roof, usually including all the habitable height and excluding mere air-spaces.

It will be seen from this table that the cost of business blocks of the same character, in the same locality, and built at about the same time varies but little, the most variation in any class of buildings being in the cost of dwellings.

The date opposite the architect's name indicates the year in which the building was erected or completed.

BUILDINGS DESIGNED BY ADLER & SULLIVAN, ARCHITECTS.

Date.	Located in Chicago.	Width.	Length.	Average height.	Cubic contents.	Cost per cubic foot.
1879	Central Music Hall, Randolph and State Sts	104	150	80	1,248,000	14.4 cts.
1881	Borden Block, Offices, Randolph and Dearborn Sts	80	100	105	840,000	14.9 "
1881	Brunswick & Balke Fact'y, Superior St.	60	254	80	1,219,200	5.4 "
1882	" " " " Huron St...	65	100	90	565,000	6.2 "
1882	L. Rosenfeld, Stores and Flats, Washington and Halstead Sts	84	152	67	885,456	10.7 "
1882	Hammond Library, Ashland Ave	47	65	60	183,300	19. "
1883	Wright & Lawther, Oil-mill, Polk St...	80	100	65	520,000	6.8 "
1883	R. Knisely, Stores and Flats, Madison St.	35	76	52	138,320	11.2 "
1884	A. Knisely, Factory, West Monroe St...	90	218	72	1,412,640	6.1 "
1884	J. W. Scoville, Factory, Desplains St...	69	111	91	697,000	6.4 "
1885	Zion Temple, Synagogue, Ogden Ave...	65	115	64	478,400	7.9 "
1887	Auditorium Building, Congress St	175	362	144	9,128,744	36. "
1887	Standard Club-house, Michigan Ave....	64	161	88	916,917	12 9 "
1888	A. Loeb & Bro., Warehouse, Michigan St.	20	90	69	123,300	12.9 "
1889	Jewish Training-school, Judd St	60	91	82	447,854	10 9 "
1891	A. Loeb & Bro., Flats, Randolph and Elizabeth Sts	46	182	65	499,531	10.4 "
1891	Meyer Building, Store, Franklin and Van Buren Sts	120	168	104	2,099,700	9.6 "
1891	J. W. Oakley, Warehouse, La Salle and Michigan Sts	101	114	121	1,390,313	6.9 "
1891	Schiller Building,[1] Randolph St	80	182	167	2,433,440	30.8 "
1893	Stock Exchange Building,[2] La Salle and Washington Sts	101	181	189	3,493,500	33.2 "

[1] Sometimes called the German Theatre, 17 stories, skeleton construction, faced with terra-cotta. Rich marble work. Theatre occupies about 4 stories. Offices above.

[2] 13 stories, flat roof, skeleton construction, rich terra-cotta facing.

The Rookery Building, Chicago, Ill. — Burnham & Root, architects. (1886.) Situated corner La Salle and Adams Streets. 177′ x 167′, eleven stories high, flat roof. Masonry construction, iron and steel interior, fireproofed. Contains an inner court 62′ x 71′. There are 550 office-rooms and spacious quarters for three banking institutions. Interior finish, throughout, antique oak. Italian marble floor and wainscoting in corridors. Ten passenger-elevators, one freight-elevator. Cost per cubic foot,[1] figured from base of foundation and exclusive of court..... 32 cts.

Monadnock Building, Chicago, Ill. — Burnham & Root, and Hollabird & Roche, architects. Sixteen stories, 68′ x 400′. Average height of roof above sidewalk 205 feet. Depth of footings below sidewalk 14 feet; 300 feet at north end ordinary brick masonry construction, 100 feet at south end, skeleton construction. Rich marblework; 16 elevators in building. Cost per cubic foot above basement-floor..... 42½ cts

Rialto Building, Chicago, Ill. — Burnham & Root, architects. Said to have cost..... 27 cts.

Masonic Temple, Chicago, Ill. — Burnham & Root, architects. (1891) Situated on corner of State and Randolph Streets. 170′ x 113′, twenty stories, pitch roof. Height from sidewalk to top of coping 274 feet. Street fronts are of dressed granite to sills of fourth-story windows; above, of brick and terra-cotta. Skeleton construction, diagonal bracing; entirely fireproof. Rich marble and metal work. 14 passenger-elevators. Cubic contents 5,436,000 cubic feet, exclusive of the court. Cost is supposed to be about $3,150,000, which makes the cost per cubic foot..... 58 cts.

Chamber of Commerce Building, Boston, Mass. — Shepley, Rutan & Coolidge, architects. (1891–2.) Occupies a triangular-shaped plot, at the junction of Central Wharf with India Street. The ground-area is 11,400 square feet. The height from the sidewalk to the top of the cornice is 94 feet, and from the sidewalk to the top of the conical roof is 170 feet. There are seven stories besides the basement. The walls are of light-pink granite, with black slate roof. Fireproof construction, high marble-work, oak-finish. Building is supported by piles; footings 10 feet below grade. Cubic contents above basement-floor, to base of conical roof, 1,811,000 feet. Cost per cubic foot..... 29 cts.

New England Life Insurance Building, Boston, Mass. — Bradlee & Winslow, architects, (187–). Built of granite, of old-fashioned construction, entirely fireproof throughout, and with all interior mouldings of Keene cement. Is said to have cost..... 60 cts.

The Hemmenway Building, Boston, Mass. — Bradlee, Winslow & Wetherell, architects. Situated at the corner of Tremont and Court Streets, with pressed-brick walls, heavily trimmed with Longmeadow stone. Is said to have cost..... 43 cts.

Board of Trade Building, Montreal, Can. — Shepley, Rutan & Coolidge, architects. (1892–3.) Ground-area 22,019 square feet. Average height of roof above sidewalk 83½ feet. Average depth of footings below sidewalk 12 feet. Cost per cubic foot..... 20 cts.

Ten-story Office-building, New York, N. Y. — R. W. Gibson, architect. Fireproof; massive granite-front; extra foundations, machinery and fixtures and rich marblework, with expensive finish. Cost per cubic foot..... 60 cts.

Ten-story Office-building, New York, N. Y. — R. W. Gibson, architect. Fireproof; stone front; machinery, fixtures, etc., and simple *marblework*. Cost..... 50 cts

Seven-story Office-building, New York, N. Y. — R. W. Gibson, architect. Fireproof; two massive stone fronts; usual machinery, plumbing, fixtures, etc., complete. Cost per cubic foot..... 37 cts.

Six-story Office-building, New York, N. Y. — R. W. Gibson, architect. Three brick and terra-cotta fronts. Non-fireproof, but with metal lathing, terra-cotta furrings and improvements; including plumbing, machinery, etc. Cost per cubic foot..... 26 cts.

A similar building with one front. Cost..... 24 cts.

Two and Four Story Office-building, New York, N. Y. — R. W. Gibson, architect. Fireproof; two granite fronts; plumbing, machinery, etc., rich marblework. Part of building one large hall, 60 feet high. Cost per cubic foot..... 47 cts.

Herald Building, New York, N. Y. — McKim, Mead & White, architects. (1893.) Stands upon a trapezoidal piece of ground 200′ x 140′ and bounded by Broadway, Sixth Avenue, Thirty-fifth and Thirty-sixth Streets. Building is two stories high, with pitch roof, containing an attic in which are the composing-rooms. The basement extends under the sidewalk on all sides, and great pains were taken to exclude moisture below grade. Walls and partitions are of stone and brick; floors of iron beams and tile arches. Building intended solely for the offices and publication rooms of the *Herald*. Total cubic contents above basement-floor about 1,090,000 feet. Cost per cubic foot, about..... 46 cts.

Mr. George B. Post, architect of many of the tall office-buildings in New York City, writes: "I can only state in general that varying with the market-rate of materials and labor, large office-buildings which I have erected have cost from 30 to 45 cts. per cubic foot, including all excavations."

[1] From *Ornamental Iron*, November, 1893.

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Chamber of Commerce, Cincinnati, Ohio. — H. H. Richardson and Shepley, Rutan & Coolidge, architects. (1887–8.) Ground-area 15,000 square feet. Highest part of roof from the ground 193 feet. Depth of footings 24 feet. Masonry construction, granite facings. Cubic contents enclosed by walls and roof above sidewalk 2,310,864 cubic feet. Cost per cubic foot..... 26 cts.

Wainwright Building, St. Louis, Mo. — Adler & Sullivan, and Chas. K. Ramsay, architects. (1890.) Situated corner of Seventh and Chestnut Streets; 10 stories, flat roof, 127½′ x 117½′ on ground, 151 feet high. Skeleton construction, stone-facing first and second stories, rich terra-cotta work above. 210 offices, 4 elevators. Cubic contents 2,186,178 feet. Cost per cubic foot..... 24 9 cts.

Union Trust Building, St. Louis, Mo. — Adler & Sullivan, and Chas. K. Ramsay, architects. (1892.) 14 stories, flat roof, 128′ x 84′ on ground, 183 feet high. Skeleton construction. Rich terra-cotta work. Cubic contents 1,968,200 feet. Cost per cubic foot..... 27.9 cts.

Equitable Life Insurance Co.'s Building, Denver, Colo. — Andrews, Jaques & Rantoul, architects. (1892.) Situated corner of Seventeenth and Stout Streets; 125′ x 200′, 9 stories high, flat roof; height of roof above grade, about 128 feet. Walls are of granite in first and second stories and of white brick with buff terra-cotta trimmings above. Average thickness of walls 3 feet. Interior construction, steel beams and Z-bar columns, thoroughly fireproofed. Partitions of terra-cotta lumber. No columns in external walls. 358 tons of steel beams in the footings. Main corridor, first story, wainscoted 9 feet high in Sienna marble; ceiling vaulted and covered with mosaic. All corridors tiled and wainscoted. Cost per cubic foot above basement floor, about..... 42 cts.

Ernest & Cramer Building, Denver, Colo. — Edbrooke & Marean, architects. (1890.) Situated corner of Seventeenth and Curtis Streets; 100′ x 125′, 8 stories high, flat roof. First story, iron and plate-glass store-fronts. Slow-burning mill-construction. Pressed-brick fronts with stone trimmings. Hardwood finish. No elaborate marblework. Three elevators. Cost per cubic foot above basement-floor..... 17 cts.

Masonic Temple, Denver, Colo. — Edbrooke & Marean, architects. (1889.) Situated corner of Sixteenth and Welton Streets; 100′ x 125′, 5 stories, flat roof. Height of roof above grade 103 feet. The first story is for stores, second and third for offices, above for society rooms. Ordinary construction; brick walls, faced with red stone; hardwood finish. No marblework, two elevators. Cost per cubic foot above basement-floor..... 19 cts.

Crocker Building, San Francisco, Cal. — A. Page Brown, architect. (1890.) Situated at the intersection of Post, Montgomery and Market Streets. Triangular plan, ground-area 12,700 square feet; street frontage 345 feet; 10 stories, flat roof. Height of roof above grade 165 feet. Average depth of footings below sidewalk 20 feet. Building is steel-skeleton construction, thoroughly braced and fireproofed, and elaborately finished in marble, etc. Three passenger-elevators, one freight-elevator. Cost per cubic foot above basement-floor, about..... 63 cts.

Endicott Building, St. Paul, Minn. — Gilbert & Taylor, architects. (1887–9.) Fronting on Robert and Fourth Streets, but not on the corner. Irregular plan; ground-area 28,510 square feet; 7 stories, flat roof. Average height of roof above sidewalk 100 feet. Average depth of footings below grade 15 feet. Fireproof pressed-brick fronts, marble wainscoting; five elevators. Cost per cubic foot, bottom of footings to top of cornice..... 29 cts.

Four-story Office-building, Rhode Island. — R. W. Gibson, architect. Fireproof, usual plumbing, heating-plant, fixtures, etc., rich marblework; stories moderate height. Cost per cubic foot..... 38 cts.

Three-story Office-building, Connecticut. — R. W. Gibson, architect. Fireproof; two stone-fronts; usual plumbing, heating-plant, fixtures, etc., rich marblework; stories of moderate height. Cost per cubic foot..... 50 cts.

Three-story Block, Denver, Colo. — F. E. Kidder, architect. (1890.) Stores in first story, lodging-rooms, second and third stories. Iron and plate-glass store-front. One front, stone-facing; flat roof. Ordinary brick and timber construction; steam-heat; substantial plumbing; pine-finish, painted. Cost per cubic foot, basement-floor to roof,..... 8½ cts.*

HOTELS.

Fourteen-story Hotel, New York, N. Y. — R. W. Gibson, architect. Brick and terra-cotta front, skeleton construction, with riveted steel frame, thoroughly fireproofed; usual plumbing, machinery, etc. Cost per cubic foot..... 44 cts.

Brown-palace Hotel, Denver, Colo. — Edbrooke & Marean, architects. (1892.) Occupies a triangular block, bounded by Broadway, Seventeenth and Tremont Streets, the total frontage being 760 feet; 9 stories, flat roof. All rooms face the street, and open from a corridor surrounding a well-room extending the full height of the building and covered with a skylight. There are 350 guest-rooms, 160 private bath-rooms and 17 public toilet-rooms, all tiled. The building is steel construction inside, with brick walls faced with red stone. No columns in walls. Thoroughly fireproof throughout, and elaborately finished in onyx and bronzed iron. Is provided with electric-light, ice and refrigerator plant, laundry, garbage-crematory, etc., Four elevators. Cost per cubic foot above basement-floor..... 30 cts.

CLUB BUILDINGS.

Denver Athletic-Club Building, Denver, Colo. — Varian & Sterner, architects. (1890–1.) Located on Glenarm Street between Thirteenth and Fourteenth Streets; 96 feet front by 125 feet deep, 4 stories, flat roof; one front. Thoroughly equipped with swimming and Turkish baths, gymnasium, hand-ball room, billard-room, social rooms, etc.; swimming-pool 30′ x 40′, 9 feet deep. Basement walls and partitions finished in pressed-brick; social rooms in oak, other portions of the building in pine. Brick walls, wood construction. One elevator. About two thirds of the building devoted to bathing and athletic purposes. Cost per cubic foot above basement-floor..... 18 cts.*

Denver Club Building, Denver, Colo. — Varian & Sterner, architects. (1887–8.) Situated corner of Seventeenth and Glenarm Streets; size 60′ x 80′ with L 40′ x 40′; 3 stories, and high pitch roof, covered with slate. Walls stone ashlar, 4 sides. Interior finished in hardwood in principal rooms. Wood construction. Cost per cubic foot from basement-floor to 10 feet above attic (unfinished) floor..... 24 cts.

LIBRARIES.

Public Library, New London, Conn. — Shepley, Rutan & Coolidge, architects. (1889–90.) One-story stone building. Ground-area, 3,407 square feet; height of cornice above sidewalk 25 feet; highest part of roof above sidewalk, 47 feet; average depth of footings 7 feet. Cost per cubic foot, 36½ cts.

Howard Memorial Library, New Orleans, La. — Shepley, Rutan & Coolidge, architects. (1888.) Ground-area 6,072 square feet; height of cornice above grade 25 feet; highest point of roof 47 feet above grade; depth of footing 8½ feet. Cost per cubic foot..... 44 cts.

HOSPITALS.

Fireproof Hospital-building, New York, N. Y. — R. W. Gibson, architect. 7 stories, pressed-brick front, stone trimmings. Cost per cubic foot, including plumbing, machinery, thorough heating and ventilating plant, much marble and tiling..... 40 cts.

Six-story Hospital-building, New York, N. Y. — R. W. Gibson, architect. Pressed-brick front, stone trimmings. Part fireproof and part not fireproof, but with metal lathing, terra-cotta furrings and improvements; plumbing, steam-plant, etc. Cost per cubic foot..... 32 cts.

MISCELLANEOUS BUILDINGS.

Hill Theological Seminary, St. Paul, Minn. — Cass Gilbert, architect. Six buildings grouped around a quadrangle. Average height of dormitory buildings, 50 feet. Average depth of footings, 8 feet. Ordinary brick masonry construction. Library, gymnasium, heating-building and all staircases fireproof with steel beams and terra-cotta arches; elsewhere wooden joist. All corridor-walls of exposed brick; oak finish. Cost per cubic foot above grade..... 11 cts.

Wingate Hall, State College, Orono, Me. — F. E. Kidder, architect. (1892.) Size of building, 82′ x 62′; 3 stories and basement; deck-roof slated and tinned, copper metal-work. Contains recitation and drawing rooms for the engineering departments, and Y. M. C. A. Hall. Basement devoted to heating and storage. Brick walls, selected common brick-facing, granite trimmings. Inside partitions principally of brick, hall and stairway wire-lathed. Cost per cubic foot above basement-floor, not including roof space..... 10 cts.*

Grammar School-building, Denver, Colo. — F. E. Kidder, architect. (1891–2.) Two-story brick building, about 88′ x 76′. Basement-floor 4 feet in ground. Deck roof, covered with shingles and tin. $15 pressed brick. Eight rooms 27′ x 32′. Play-rooms in basement. Smead-system heating and ventilation. Brick partitions. Cost per cubic foot, basement-floor to second-story ceiling..... 9½ cts.*

Grace M. E. Church, Cambridgeport, Mass. — F. E. Kidder, architect. (1886–7.) Two-story wooden building, 58′ x 76′ with projections. Tower and spire 109 feet to base of finial. Slate roof, copper metal-work. Cost per cubic foot including furnaces, pews, frescoing and gas-fixtures above cellar-floor, but not including roof space..... 8¾ cts.*

Christ M. E. Church, Denver, Colo. — Kidder & Humphreys, architects. (1889–91.) Two-story stone church, 50′ x 90′ with projection. Stone tower, 71 feet high with frame spire above, 108 feet high, covered with shingles. Total height to top of finial 190 feet. Texas pine finish in first story, oak in second story. Price per cubic foot (above cellar-floor, but not including roof space) including steam-heat, pews, frescoing, glass, etc..... 20 cts.*

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DWELLINGS.

City dwellings in Chicago, designed by Adler & Sullivan. Cost per cubic foot, from..... 17 to 20 cts.

Of dwellings designed by the writer, the average cost of 8 and 10 room wooden houses in Boston, in 1886, per cubic foot of habitable space including cellar, was about..... 11 cts.*

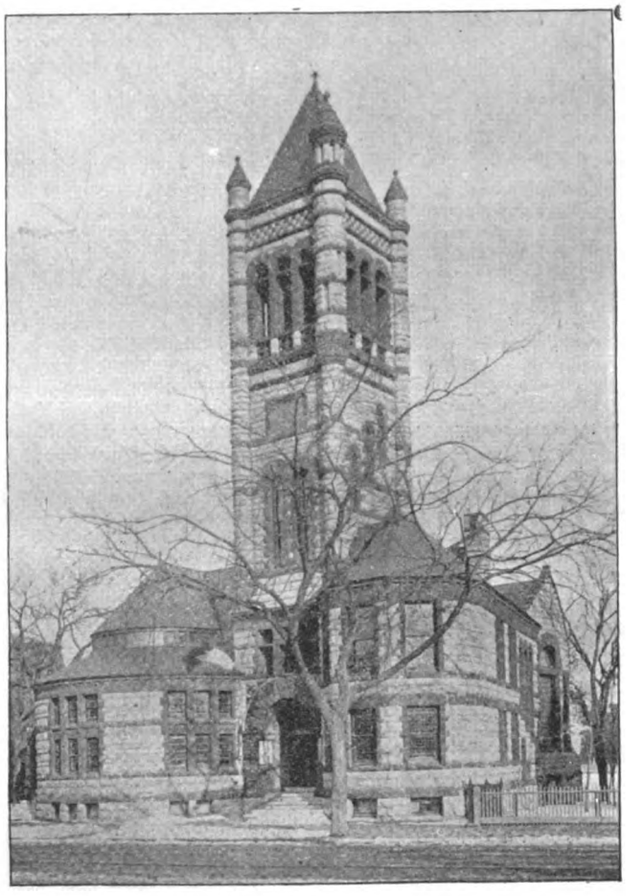
In Denver, Colo., the cost of a first-class stone house, with hardwood finish, steam-heat, extra plumbing, decorations, etc. complete, is about..... 27 cts.*

Brick houses of 10 rooms, pine-finish, furnace-heat, good plumbing, etc. Cost per cubic foot above cellar-floor, but not including unoccupied roof space, about..... 14 cts.*

Cheap eight-room brick cottages of one and one-half or two stories, bath-room and furnace, cubic space reckoned from cellar-floor, but not including unoccupied roof space, can be built for..... 10 cts.*

For the cost of United States Public Buildings the reader is referred to a list of the cost per cubic foot of thirty-eight buildings which was published in the *American Architect* of February 5, 1887. F. E. Kidder.

THE ART OF BOOK AND NEWSPAPER ILLUSTRATION.[1]



Church on North Ave., Cambridge, Mass. A. P. Cutting, Architect, Worcester, Mass.

THE best drawing for process reproduction is one that requires little or no touching on the part of the engraver or maker of the blocks; but it is difficult to impress on the artistic mind the necessity of conforming to certain rules. Some cannot draw firm, clean lines at all, and *should not attempt them.* Few allow sufficiently for the result of reduction and the necessary thickening of some lines.[2] The results are often a matter of touch and temperament. Some artists are naturally unfitted for line work; the rules which would apply to one are almost useless to another. Again, there is great inequality in the making of the cheap zinc blocks, however well the drawings may be made; they require more care and experience in developing than is generally supposed.

GELATINE RELIEF PROCESS.

Let us look now at the enlargement of a line-drawing which is more difficult to reproduce; a portrait by the late Frank Holl, R. A. (drawn on Whatman paper, 4½″ x 3½″), in which there are many pale, uncertain and complicated lines which could not be produced well by the process just described. Here a more delicate and sensitive method is necessary to obtain a relief-block. It is called the "gelatine process," or the "Gillot process."

The drawing is photographed to the required size (as before), and the *negative* laid upon a glass plate (previously coated with a mixture of gelatine and bichromate of potash). The part of this thin, sensitive film, exposed to the light, is absorbent, and when immersed in water swells up. The part protected from the light by the lines of the drawing remains near the surface of the glass. Thus you have a negative from which a metal cast can be taken, leaving the lines in relief as in the zinc process. In skilful hands this process admits of more delicate gradations, and the pale uncertain lines in the drawing before us can be reproduced with tolerable fidelity. The blocks take longer to make, and are double the price — roughly, 1*s.* per square inch — of the first process described. There is no process yet invented which gives better results from a pen-and-ink drawing for the type-press. These blocks when completed have a copper surface. The reproductions of pencil, chalk or charcoal drawings by the above processes are nearly always failures, as we may see in the best artistic books and magazines to-day. I will refer to them presently.

For those who cannot draw easily with the pen, there are several kinds of grained papers which render drawings suitable for reproduction. The first is a paper with black lines imprinted upon it on a material suitable for scraping-out to get lights, and strengthening to get solid blacks. The drawings thus made can be reproduced in relief like line-drawings, taking care not to reduce the black grain much or it becomes "spotty." Another paper largely used has a white grain, a specimen of which I will show you presently on the screen; and there are other variations of grained papers on which we will not dwell.[3]

Here the question may arise in many minds, are these contrivances with their mechanical lines for producing effect, worthy of the time and attention which has been bestowed upon them. I think it is very doubtful if much work ought to be produced by these means; and certainly in the hands of the unskilled, the results would prove disastrous. A painter may use them for sketches. Mr. Compton, as you see, can express very rapidly, by scraping out the lights and strengthening the darks, a snow-drift or the surfaces of a glacier. The late C. J. Watson and the French artist, M. Bistagne, have shown us how the white-grained paper can be played with, in artistic hands, to give the effect of a picture in a quarter of an hour.

MECHANICAL DOTS.

The increased use of mechanical dots to give shadow and color to a pure line-drawing is always to be regretted, whether it be applied to a necessarily hasty newspaper sketch, or to one of Vierge's handsomely printed illustrations for the "*Pablo di Segovia.*" One cannot condemn too strongly this system, so freely used in Continental illustrated sheets, which, in the most skilful hands, seems a degradation of the art of illustration. These dots and lines, used for shadow, or tone, are laid upon the plate by the maker of the block, the artist indicating, by a blue pencil mark, the parts of a drawing to be so manipulated; and as the illustrator has not seen the effect on his own line-drawing, the results are often a surprise to every one concerned. I wish these ingenious contrivances were more worthy of an artist's attention. Nothing but the speed with which a sketch for a newspaper can be thus made seems to excuse its use. Hurry is the secret and the mischief of it all.

Here is an example taken from an English print, by which you see that all daylight has been taken ruthlessly from an open-air sketch. The system is tempting to the hurried illustrator; he has only to draw in line (or outline, which is worse), and then mark where the tint is to appear; and the dots are laid on the zinc plate by the maker of the blocks.

In the enlargements before you [referring to two examples from the *Daily Graphic;* one partly and one wholly covered with dots] it will be obvious that the artist's sketch is injured by this treatment, that, in fact, the result is not artistic at all. Nothing but high-pressure or incompetence on the part of the illustrator can excuse this mechanical appliance to an incomplete drawing. Again I must remind you that these results are not the fault of the "process," or of the "process man." But the system is growing in every direction, to save time and trouble, and is lowering the standard of topical illustrations. And it is this system (*inter alia*) which, I believe, is to be taught in technical schools, where the knowledge of process is taking the place of wood-engraving.[4]

The question is again uppermost in the mind, are such mechanical appliances ("dodges," I venture to call them) worthy the serious

[1] Portions of a lecture by Henry Blackburn delivered before the Society of Arts and published in the *Journal* of the Society.

[2] All drawings for reproduction should be marked in the margin by the artist as to the amount of reduction intended. It is a useful guide to all concerned in publication.

[3] Mr. C. G. Harper, in his excellent book on "*English Pen Artists,*" has treated of other ways in which drawings on prepared papers may be manipulated for the type-press.

[4] The rendering of a chalk or pencil drawing into a relief-block, to be printed on rapid machines with inferior paper and ink, is another branch of process which I think the student of art had better not know much about, for the process has never been successful under the best conditions. He would be better occupied in learning drawing on stone, an art which does not come into the scope of these lectures, as it is seldom used in book-illustration and cannot be printed at the type-press. It is well worthy of study now, for the art is being revived in England on account of the greater facilities for printing than formerly. It is possible to obtain excellent results from chalk and pencil drawings in intaglio; photographed and printed as a copper-plate; as may be seen in the specimens by the Autotype Company on these walls.

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attention of artists; and can any good arise in imparting such knowledge to youthful illustrators in technical schools? Wood-engraving was a craft to be learned, with a career for the apprentice. *There is no similar career for a lad by learning the "processes" at technical schools;* and nothing but disappointment before him if he learns the mechanism before he is an educated and qualified artist.

It should be mentioned that all wood or steel engravings reproduce easily by the common zinc line process, but the reproductions are apt to lose brightness, and if much reduced break up or become spotty. Mention should be made also of drawing on prepared transfer-paper with autographic-ink, which is transferred to zinc without the aid of photography, a process very useful for rapid and common work; but it is irksome to the artist and not capable of very good results; moreover the drawing has often to be minute, as the reproduction has to be the same size as the original.

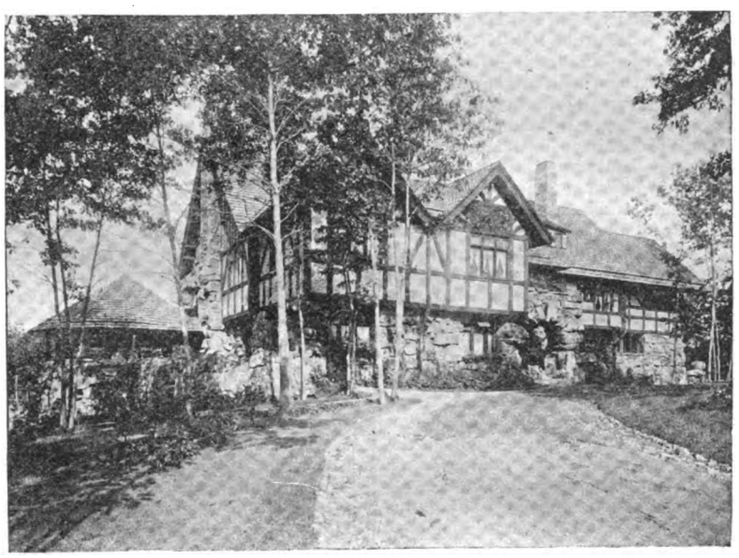
HALF-TONE PROCESS.

I now come to the method of reproducing wash-drawings and photographs, on blocks suitable for printing at the type-press, commonly known as the Meisenbach or "half-tone process;" a most ingenious and valuable invention, which, in clever hands, is capable of artistic results, but which in common use has cast a gloom over our illustrations in books and newspapers.

Now, to make these blocks; as there are no lines or whites in a painting, or in a photograph from nature, it is necessary to obtain some kind of grain, or interstices of white, on the zinc plate, as in a mezzotint. So, between the drawing or photographic print to be reproduced and the camera, glass-screens, covered with lines or dots, are interposed, varying in strength according to the light and shade required; thus turning the image of the wash-drawing practically into "line," with sufficient interstices of white for printing purposes.

Thus, all drawings in wash, chalk, pencil, etc., that will not reproduce by the direct line processes, already referred to, are treated for printing at the type-press, and thus the uniform, monotonous dulness with which we are all familiar, pervades the page.

The artist who draws in wash with body-color, or paints in oils in monochrome, for this process, will see at once that his high lights will be lost, and his strongest effects neutralized, under this effect of gauze; in short, that there is no longer any breadth of white or black in his picture; and so, for pictorial purposes, the illustrator who draws in wash has to *force his effect*, and exaggerate his lights and shades, avoiding too delicate gradation, and in his different tints keeping, so to speak, to one octave instead of two. Thus, also for this process, to obtain brightness and cheap effect, the illustrator of to-day often avoids backgrounds altogether.



House of James L. Breese, Esq., Tuxedo Park, N. Y. R. H. Robertson, Architect.

Some excellent results (which I will show you presently on the screen) may be obtained by experienced and practised draughtsmen, if their work is well reproduced with a fine grain, and printed carefully on good paper. But where the block has to be prepared for printing, say 5,000 an hour off rotary machines, a coarser grain has to be used, producing the "Berlin-wool pattern" effect you see before you.

There are many ways by which drawings unsuitable for the relief-toned processes are made available. Great advances have been made in the "screening" of pencil drawings where a great deal of white has to be left. You may trace the screening on every part of the enlarged proof before you. [Reproduction of a pencil sketch by Mr. Melton Prior.] These two wash-drawings by Mr. S. Begg and Mr. Greville Manton, which have appeared lately in the *Black and White* newspaper, are good examples of the way to draw for reproduction: the artists have, you will notice, met the process half way, they have been careful to use broad, clear, firm washes, and they have done them with a certain hand, the result of experience. If, in the endeavor to get the best results out of a few tones by the mechanical process, their work lacks some artistic qualities, it is almost a necessity; but the tendency of this most modern form of illustration is to think too much of *technique*. But with the utmost care and patience on the part of the artist, these wash-drawings, rendered by the half-tone process, are uncertain and artistically incomplete. It is more suitable for the rendering of sketches. Of the illustrators who use this process in a more free and easy way we will now take an example [an enlarged wash-drawing was shown upon the screen].

Here truths of light and shade are disregarded, figures stand out in unnatural blackness against white paper, and flat mechanical shadows are cast upon nothing. Only sheer ability on the part of a few modern illustrators has saved these coarse ungainly sketches from universal condemnation. But the splashes, and spots, and stains, which are taking the place of more serious work in illustration, has become a vogue in 1893. The sketch is made in two or three hours, instead of a week; the process is much cheaper than wood-engraving. The public is satisfied with a sketch where formerly a finished illustration was required, if the subject be treated dramatically and in a lively manner. If it comes out an unsightly smear on the page, it answers the purpose of topical illustration, and apparently suits the times. It is scarcely too much to say that this example would not have been tolerated a few years ago. But it is the taste of the times to which the modern illustrator has adapted himself; and it is little short of a revolution in illustration, of which we do not yet see the end. One thing we must continually bear in mind, that these hastily produced blotches called illustrations, which disfigure the pages of so many books and magazines, are the result of want of care on the part of the artist rather than of the maker of the blocks. The latter are, according to my experience, the most patient and painstaking of operatives.

The result of all this — a very serious one to the artist as far as we can see ahead — is the gradual substitution of photographs from life for any other form of illustrations. The Meisenbach reproduction of a photograph I now show you answers the purpose of the editor of a newspaper to fill a page of his paper, where formerly artists and engravers would have been employed. The excuse for it is that the details of the dress are so well rendered on the block as to answer the purpose of a fashion-plate — apparently a most important matter.

Now let us see what becomes of a very artistic photograph when put through the half-tone process. Here is the photographic print from a painting by M. Jules Lefèbre [portrait of girl reading, shown on the screen]. This excellent silver print, full of delicate gradations and strong effects, appears on the plate through the film of gauze, dull, flat and comparatively uninteresting; but the expression of the original is given with more fidelity than could be done by any ordinary wood-engraving. To touch this on the negative and bring out the lights and accents of the picture is the common thing to do by the makers of the blocks; but it is a hazardous process at the best, when dealing with the copy of a painting. I mention it to show where handwork in the half-tone process first comes in. The block, when made, is also often touched-up by an engraver in places, especially where spotty or too dark; on this work many who were formerly wood-engravers now find employment.

But the ideal illustration by process, whether from a line-drawing, wash, or photograph, it cannot be repeated too often, is the one which requires the least manipulating on the part of the maker of the block, who has seldom, or never, the opportunity to attend to it properly. In the case of the reproduction of photographs, especially, which we are now considering, much may be done by working up a platinotype print before giving it out to be made into a block. Much depends here upon the artistic knowledge of editors and publishers, who have it in their power to produce good or bad illustrations from the same original. The makers of these blocks being confined to time and price, are practically powerless.

Here let us pause for a moment to consider the material of which one number of an illustrated paper is made up, and how far the artist and wood-engraver has part in it. It will be instructive from an economic point of view. I take a copy of *Sketch* because it is a typical and quite "up to date" publication, vieing in circulation and importance with the *Illustrated London News*, both published by the same proprietors. In one number there are upwards of 30 pages, 10 being advertisements. There are in all 151 illustrations, of which 63 appear in the text part, and 88 in the advertisement pages. Out of these text illustrations, 24 are from original drawings or sketches. Next are 26 photographs from life (several being full pages), and 13 reproductions from old engravings, etc., reproduced by mechanical processes — in all 63. Some of the pages reproduced from photographs are undeniably good, and interesting to the public, as is evidenced by the popularity of this paper alone. In the advertisement portion are 88 illustrations (including many small ones), 85 of which have been engraved on wood; a number of them

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are electrotypes from old blocks, but there are many new ones every week. The reason for using wood-engraving largely for advertisements is, that wood blocks print more easily than "process," when mixed with the type, and print better (being cut deeper on the block), where inferior paper and ink are employed. But this class of wood-engraving may be summed up in the words of one of the craft to me lately: — "It is not worth £2 a week to anybody." (I will refer to the better class of wood-engraving, when speaking of books next week.)

Thus, it will be seen that, in the "text" part of this newspaper, two-thirds of the illustrations have been produced without the aid of either artist or engraver!

To turn to other subjects where the photographer is the illustrator. The photographer goes down a mine with his apparatus, and takes a series of views of the workings, which could probably have been done by no other means. Under most difficult circumstances he sets his camera, and by the aid of the magnesium flash-light gives us groups of figures at work amidst gloomy surroundings. Whether these are not both artistic and valuable as illustrations I leave you to judge. [Here two slides, taken in the Cambrian lead-mines by Mr. J. C. Burrow, of Camborne, were shown, and others were exhibited on the walls.] The remarkable part, artistically, is the good color and grouping of figures. One great value of these illustrations consists in the clear definition of detail. These photographs are shortly to be published in a book by Mr. Burrow and Mr. Thomas.

Another instance of the use of photography in illustration: Mr. Frederick Villiers, the special artist at Chicago for the *Black and White* newspaper, made a startling statement lately in this room. He said that out of some 150 subjects which he took in Chicago not more than half-a-dozen were drawn by him; all the rest being "snap-shot" photographs. Some were very good, could hardly be better, the result of many hours' waiting for the favorable grouping of figures. That he would redraw some of them with his clever pencil for this newspaper is possible, but observe the part photography plays in the matter. I could mention many instances where the photographer and his models are producing illustrations of a dramatic kind, a system which cannot be ignored. (In America a novel has been thus illustrated both in figure and landscape.)

The last example of the photographer as illustrator, which can be given here, is where a photograph from life engraved on wood is published as a vignette illustration. [Slide from the *Graphic* of October 28, 1893.] It is worth observing, because it has been turned into line by the wood-engraver, and serves for printing purposes as a popular illustration. The original might, perhaps, have been more gracefully posed, and the effect may be to a certain extent, a "fluke," but it is pretty as a vignette, and pleases the public. There are hundreds of such subjects now produced by the joint aid of the photographer and the process engraver.

Here we may observe that it is not the artist and the wood-engraver who are "working hand-in-hand" in the production of the great majority of illustrations, as in America, but the photographer and the maker of process-blocks. This is significant. Happily for us there is much that the photographer cannot do pictorially. But the photographer is, as I said, marching on and on, and the line of demarcation between original and photographic illustrations is less marked than formerly.

The photographer's daughter goes to an art school, and her influence is shown clearly in the exhibitions of the photographic societies. This influence and this movement is so strong — and vital to the artist — that I feel it cannot be emphasized too much. The photographer is ever in our midst, correcting our drawing with facts and details which no human eye can see, and no one mind can take in at once.

Of the obligations of artists to photographers a book might be written. The benefits are not, as a rule, unacknowledged; nor are the bad influences of photography always noticed. That is to say, that before the days of photography, the artist made himself acquainted with many things necessary to his art, for which he now depends upon the photographic lens; in short, he uses his powers of observation less than he did a few years ago. That the photographer leads him astray sometimes, is another matter.

"Whatever developments may await the art of photography," says Mr. William Small in 1893, "it will never take good work out of a good artist's hands." In line work (the best and surest for the processes) photography can only be the servant of the artist, not the competitor — and in this direction there is much employment to be looked for. But in whatever material or style, newspaper illustrations, to hold their own, must be of the best. Let them be as slight as you please, if they be original and good. At present we are casting off — ungratefully it would seem — the experience of the life time of the wood-engraver, and are setting in its place an art half-developed, half-studied, full of crudities and discords. The illustrations which succeed in books and newspapers succeed, for the most part, from sheer ability on the part of the artist; they are full of ability, but, as a rule, are bad examples for students to copy. "Time is money" with these brilliant executants; they have no time to study the value of a line, nor the requirements of the processes, and so a number of drawings are handed to the photo-engravers — which are often quite unfitted for mechanical reproduction — to be produced literally, in a few hours. It is an age of vivacity, daring originality, and reckless achievement in illustration. "Take it up, look at it, and throw it down," is the order of the day. But there is no reason, but laziness, why the work done "to look at," should not be as good as the artists can afford to make it. The manufacturer of paper-hangings or printed cottons will often print only a limited quantity of one design, no matter how beautiful, and then go on to another. So much the better for the designer; but he would not keep employment if he did not do his best, no matter whether his work is to last for a day or for a year. The life of a single number of an illustrated newspaper is a week, and of an illustrated book about a year.

The young illustrators on the *Daily Graphic* — notably Mr. Reginald Cleaver — obtain the maximum of effect with the minimum of lines. Thus Caldecott worked, spending hours sometimes, studying the art of leaving out. Charles Keene's example may well be followed, trying drawing after drawing, no matter how trivial the subject, until he was satisfied that it was right. "Either right or wrong," he used to say, "'right enough' will not do for me."

Another influence on modern illustrations — for good or bad — is the electric-light. It enables the photographic operator to be independent of dark and foggy days, and to put a search-light upon objects which otherwise could not be utilized. So far, good. To the illustrator this aid is often a doubtful advantage. The late Charles Keene (with whom I have had many conversations on this subject) predicted a general deterioration in the quality of illustrations from what he called "unnatural and impossible effects," and he made one or two illustrations in *Punch* of figures seen under the then — (ten or fifteen years ago) — novel conditions of electric street lighting, one of which I will show you on the screen. [Illustration of a gentleman who has been dining, returning home through a street lighted by electric lamps.] Charles Keene's predictions have come true — we now see the glare of the magnesium-light on many a page, and the unthinking public is dazzled every week in the illustrated sheets with these "unnatural and impossible effects." Thus it has come about that what was looked upon by Charles Keene as garish, exaggerated, and untrue in effect, is accepted to-day by the majority of people as a lively and legitimate method of illustration.

PROCESS-BLOCK MAKERS.

I must mention one more influence on the young illustrator. The "process man," the teacher and inciter to achievements by this or that process, is not usually an "artist" in the true sense of the word. He knows better than any one else what lines he can reproduce, and especially what kind of drawing is best adapted for his own process. He will probably tell the young draughtsman best what materials to use, what amount of reduction his drawings will bear, and other things of a purely technical, not to say business-like character. Let me not be understood to disparage the work of photo-engravers and others engaged on these processes; on the contrary, the amount of patience, industry, activity and anxious care bestowed upon the reproduction of drawings at the present time is astonishing, and deserves our gratitude. Their work in England is a new industry of an important kind, in which art and craft are bound up together. The photo-engravers are our faithful friends, and are ready to serve us well, if only the public (represented by editors and publishers) will recognize that *good work requires good pay.* The day has passed when "process work" is to be looked down upon as only fit for the cheapest, most inferior and inartistic results.

There is no doubt that the makers of process-blocks are the best instructors as to the results to be obtained by certain lines and combinations of lines; but in the majority of cases they will tell the artist too much, and lead him to take too much interest in the mechanical side of the business. His best protection against this tendency, his whole armor and coat of mail, is *to be an artist first and an illustrator afterwards.*

This is the sum of the matter. Perhaps some of the examples I have brought here to-night may help us, and lead to a more thorough testing of results by capable men.

EARLY ITALIAN ART.

THE art of Italy from 1300 to 1550, embracing all branches of arts and crafts, is a fascinating subject; and doubtless, the exhibition just opened at the New Gallery, in London, will, by its popularity, repay the committee for their trouble in getting together this wonderous show of examples from the best period of artistic workmanship. Of the pictures it is needless to speak. Are not Lippi and Signorelli, Botticcelli, Masaccio and Ghirlandajo always with us, whether we inhabit the New or the Old World? for if pictures are not available, photographs give us a very fair idea of the leading characteristics of these artists. The charm of this exhibition consists in the remarkably fine specimens of armor, church vessels and the jeweller's art — pendants, rings and the like.

One of the finest portable altars now existing is here: it belonged formerly to Cardinal Bessarion, who bequeathed it to the Abbey of Avellanna in Gubbio. During the French occupation of Italy, the abbot sold it to Count Cicagnara, from whom it passed into the hands of Dr. Rock, who bequeathed it to St. George's Cathedral. The slab is of oriental jasper; the border of niello with corner-pieces representing the four Elements as youthful virgins. In the centre of the north border is the Lamb; to the left

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St. Michael; to the right, St. Gabriel. In the centre of the south side, a dove with a nimbus. It is probably of the twelfth century. These portable altars were used in troublous times, or when an army was on the march. They were placed upon any ordinary table or shelf; and sometimes were supported by legs which fitted into the slab. This seems to have been the case with the other example exhibited here, a slab of porphyry let into an oak frame, on the under side of which are four holes which seem to suggest sockets for supports. These little portable altars were used in the early years of Christianity in order to prevent the possibility of pollution or contamination of the Sacred Elements.

A silver-gilt chalice by Bartolommeo d'Atri, curiously wrought with vine leaves, was once in the possession of Pope Boniface VIII (1294–1303); and a silver hand-bell, exquisitely chased with foliage and masks, animals and male and female figures in high relief, bears the emblem of Giulio de' Medici, otherwise Pope Clement VII, to whom it belonged.

The sixteenth-century rock-crystal vases bear comparison with those in the Louvre. They are richly engraved in arabesques, and mounted in gold enamel; the handle is formed by a winged dragon, the lip by an eagle's head — the work of Charles Duron, of Paris. Some pendant jewels belonging to Baron Ferdinand de Rothschild are very fine. One is in the form of a marine horse. The body of the animal is one huge baroque pearl with a white enamelled head; the chains are ornamented with rubies and emeralds. Another pendant represents a fish, and another a little parrot perched upon a sort of enamelled cage, jewelled and engraved.

But perhaps the most exquisite piece of goldsmith's work turned out in the sixteenth century by the Italians, is the reliquary belonging to Mr. William Boore, and exhibited some years ago at the South Kensington Museum. It is a portion of some saint's arm-bone, about three inches long, mounted in a framework of hoops of jewelled gold. At each end of the bone is a circular plate exquisitely enamelled in blue, green and gold, and forming the lid of a small receptacle, in which, formerly, a scented pastille was enclosed, as a precaution against unpleasing odors. Standing upright upon the cylinder of bone is a group of the Crucifixion. The figures are in full relief; the Blessed Virgin in blue, St. John in green; and so minute is the workmanship of these *lavoro di piastra* little figures, that, although they measure less than an inch, the expression of the faces and hands is discernable. The cylinder is held up by two jewelled chains, uniting at the top in an arched ornament set with diamonds and rubies, and having a ring by which the whole is suspended. Three pendants, formerly attached to the lower part of the cylinder, are lost. For fineness of workmanship, this jewel is unique. It is said to have been given by Catharine of Braganza to the Compton family of Hartpury in Gloucestershire. Another of Mr. Boore's treasures is the silver-gilt stem of a cup by Cellini; and certainly the exquisite workmanship of the little angels' heads, and the garlands and flowers surrounding them are evidence that the maker was no mean master of the goldsmith's art.

Paintings upon crystal are not common, but the "Adoration of the Magi," belonging to Sir Henry Austin Layard, is a fine specimen, having all the appearance of translucent enamel.

The greatness of a nation in matters artistic consists in its power of adding beauty to all objects of utility; and thus the Dutch, the Germans and even we English have excelled in certain branches of art work. We have all produced a few painters of first-rate order; the Dutch have also been adepts in the silversmith's art, and the Germans in manuscript and miniature painting; wood-carving and embroidery, too, have had masters amongst these nations. But none of them have excelled in all arts as have the Italians. Their bronzes, their carvings, their glass, their faïence, their armor, their miniatures, their needlework and their jewelry are as superior to all others in masterly finish and pureness of design, as are their great Venetian and Florentine Schools of Painting. Greece also was perfect, so far as we know, in all branches of art — but then we know so little except by books; so much that was beautiful has perished; and we can only infer by the perfection of their work in marble and bronze, that their pictorial and other arts equalled their sculpture and their jewelry. France, too, comes in her fine Renaissance work very close to Italy; but the child did not equal the mother; for it was from Italy that France gained her inspiration, and it was in Italy that art was a living force. From the knocker upon the outer door to the bellows in my lady's chamber, every inch of the house, every utensil in use, every garment and ornament worn by the owners of the dwelling, was so exquisite a work of art that we moderns dispute for its possession, and are filled with envy when we find ourselves the losers to our friends the happy purchasers. Many of the objects in the exhibition are not only exquisite in art workmanship, but are highly interesting as relics of former times. Here is a medicine-chest containing a secret drawer for antidotes to poisons which belonged to Cosimo de' Medici. In another case is the cetera, a species of guitar, which, originally belonging to Titian, descended to the great singer Mario, and subsequently was in the possession of Rossini, the composer. It is signed by the maker, Gironimo Campi.

A good many of the objects in the celebrated Spitzer Collection, purchased by Mr. George Salting, are here; and in a breastplate of steel, *repoussé* and richly damascened with gold, one may conjure up in imagination the owner of that pink-and-gray-complexioned face, Philip IV of Spain, so often and so magnificently portrayed by Velasquez. How came the Westminster Abbey cope into the hands of the rector of Stonyhurst College? Through what vicissitudes has it passed since Henry VII gave the order for its fabrication at Florence? "The whole suit of vestments and coapies of cloth-of-gold tissue wrought with our badges of red roses and portcullises, the which we of late caused to be made at Florence, in Italy, which our King Henry VII in his will bequeathed to God and St. Peter, and to the Abbot and Priory and Convent community of our Monastery of Westminster." [*Testamenta Vestuta ed Nicholas.*] It would be a graceful act to return the vestment to the successor of the Abbots, the Dean of Westminster, who might wear it at the next coronation.

The residenza, or ceremonial throne of Giuliano de' Medici, is a long, broad seat, with a back surmounted by a canopy. It was carved by Bascio d'Angolo in the early part of the sixteenth century. The canopy is supported by pilasters between which are marquetry panels. The cushion is of velvet pile. After the death of Giuliano in 1516, it became the property of Count Nuti, who was attached to the Court of the Medici, and with whose descendants it remained until 1872 when it was sold to Prince Demidoff. The authenticity of this fine work of art is attested in a document signed by the Director of the Pitti Palace, the Countess Nuti and others.

Among the autographic letters is one which must interest Americans particularly. It is from Emerico Vespucci, the celebrated navigator, to his father. It is dated Trivio Mugelli, October 18, 1476, and written in Latin, the writer apologizing for using a language with which he is not very familiar. Of news he says there is none, except that every one wants to move and live near the city. A letter of Benvenuto Cellini to Vincenzo Borghini, Prior of the Innocenti, excuses his non-attendance at Michael Angelo's funeral, upon the plea of ill health. Perugino writes to Isabella d'Este, that he hopes, with God's help, to finish the Duchess's picture shortly. Pietro Aretino, like the rest of us, is sadly in want of money, so he writes to Cosimo de' Medici, to assure him that he, Aretino, has no communication with the exiles; hoping by this means to extract some cash from the great man. Cosimo de' Medici writes to a London friend about some money matters between the writer and the King of England; and Poliziano indites a letter to Lorenzo de' Medici, believing his correspondence to be interesting because he always writes about Lorenzo's relatives!

The Queen has lent some specimens from her fine collection of original drawings. They are by various artists and demonstrate that success always succeeds. Many of these drawings would not be much noticed had not the authors been great in painting. But Michael Angelo stands out like a giant. "The Tale of Phaethon" is a wonderful piece of imaginative drawing, for no models, horse or man, could possibly be placed in such positions for more than a second. Exquisite also is the anatomical study of a man. As to the delicious studies of leaves and flowers by Leonardo, what school-of-art student of freehand who had passed his examination would condescend to do such insignificant things? Nevertheless they are masterpieces.

PENGUIN.

COMMISSION ON OLD MATERIALS.

THE re-use of old materials in building operations is a very common occurrence, especially in the reconstruction of business premises in towns; but how the re-employment of old materials should affect the architect's commission seems to be a question that admits of different answers, according to the view taken of his duties. Many people, when they rebuild their premises, and use a large quantity of the bricks and timber of the old building, imagine that they ought to be savers both on the building and also on the architect's fees. Generally, after crediting the old material available, and deducting therefrom the cost and labor of pulling down, removing and cleaning, the contractor is able to show an appreciable saving in his tender, and the owner rushes to the conclusion that the architect's commission will be so much the less. But as this commission is supposed to be charged on the total cost of the work, including new materials, the architect is entitled to charge on the total value of the old materials without deduction. It makes no difference to him whether the materials used are new or old; he has to exercise the same skill in arranging and treating them, and therefore is entitled to the same amount of remuneration. The cost and labor of cleaning the bricks, etc., have nothing to do with the architect, as, if deducted from their value on the estimate, his commission would be so much the less than if new materials were used in the building. To deduct the cost of labor in cleaning and converting old materials is equivalent to an appreciable reduction in the materials required to execute the design. It would be unfair to suppose that the cost of converting old material should fall upon the designer, as if he was a gainer by the transaction, or was responsible for, or interested in the process. If the architect could only charge on the net value of old materials, it would be like expecting a painter to pay for the cost of painting-out and preparing an old canvas that may be given him for a new picture. To put an extreme case, we may imagine the labor and expense of cleaning and preparing the old material to equal their value. In such a case, is the architect to lose his commission on the value? If he were, he might in not a few instances have to sacrifice a large proportion of his remuneration. In brickwork, for example, the approximate proportion of materials to labor is about sixty-six per cent, and the labor only thirty-three per cent, or two-thirds material to one-third labor; so that in a building made up chiefly of

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brickwork, like a factory or chimney, the architect depends mainly on the value of the materials to compensate him, and hence the rule that the total value of building work is taken as if all new materials were used.

In foundations a large amount of old bricks are used, especially in works of alteration or rebuilding, generally the most troublesome kind of building, and involving a great deal of skill and labor on the part of the architect. But if the cleaning and removal of the old materials were deducted from their value, the architect's remuneration for all the extra trouble required would be quite inadequate at the usual percentage. In many cases of rebuilding quite sixty or seventy per cent may be spent for pulling-down and cleaning the old materials, so that in a large building of several thousands the commission of the architect would be greatly reduced in consequence of this reduction in the value. Yet, without considering these reasons, we hear of persons who are about to build obtaining all their own materials, bricks, timber, fittings, etc., and obtaining tenders for the labor, supposing that by such means the architect's commission will be less, chargeable only on the labor or on the reduced estimate thus obtained. In an ordinary house, putting the labor down at one-third the total cost, the architect on this system would only be paid in the same proportion, a fact which only need to be stated to show how preposterous the idea is. The professional "five per cent" has been based on the assumption that a fair proportion of the total value of a building is made up of materials. In a work of skilled masonry or joinery, where the materials bear a much smaller ratio to the amount than brickwork, usually one-third, the commission would be ridiculously low. These are points for the architect to consider when he has to deal with a large quantity of old materials, or when from other causes his work is one of skilled labor. He should make it understood that if the materials are not to be included, his commission must be at a higher rate. — *Building News.*

SOCIETIES

BEAUX-ARTS SOCIETY OF ARCHITECTS, NEW YORK.

BY the courtesy of the Architectural League, there will be held in their rooms, American Fine Arts Society Building, 215 West 57th Street, a free exhibition of architectural drawings made in France, Italy and Greece, by Mr. Albert Randolph Ross; to commence February 8 and continue two weeks.

This remarkable collection is considered by the Society (under whose auspices it is exhibited) to be the best ever shown in this country for purity, style, and selection of subjects, and it is hoped that an appreciation for really good drawings will be shown by a large attendance. Wm. A. Boring, *President.*

SKETCH-CLUB OF NEW YORK.

The regular monthly meeting of the Club was held at the club-rooms Saturday evening, February 4, sixty-two members and one guest being present. This was the meeting for the election of officers for the ensuing year. The greater part of the evening was spent in reading reports and voting. The elected officers are: Mr. Edgar Josselyn, *President;* Oliver J. Cummings, *Vice-President;* H. C. Pittman, *Recording Secretary;* H. H. Braun, *Corresponding Secretary;* Willard Hirsch, *Treasurer;* Harry L. Parkhurst, *Chairman of Current-work Committee;* Mr. J. J. Petit (re-elected), *Chairman of Entertainment Committee;* Mr. G. M. Pollard, *Chairman House Committee.*

The January competition for a "Cathedral Pulpit" was criticised by Mr. Francis L. Ellingwood, Mr. H. H. Braun receiving first place. H. C. Pittman, *Rec. Secretary.*

AMERICAN INSTITUTE OF ARCHITECTS.

At the January meeting of the Directors of the American Institute of Architects, a committee consisting of E. H. Kendall, 150 Fifth Avenue, New York, N. Y.; R. W. Gibson, 18 Wall Street, New York, N. Y.; E. A. Kent, White Building, Buffalo, N. Y.; James W. McLaughlin, 46 Johnston Building, Cincinnati, Ohio, and W. L. B. Jenney, 1120 Home Insurance Building, Chicago, Ill., was appointed "to report as to the relation of the Chapters to the Institute and to recommend such changes in the by-laws as they may deem expedient." The committee desires to know as early as possible the views of the practising architects of the country, both members and those who are not members of the Institute, as to the relationship of the Chapters to the Institute, as it is well known that there are many persons desirous of becoming members of the Institute whose residence makes it impracticable to become members of any Chapter of the Institute, and at the same time it is well recognized that persons living where they can become members of Chapters should affiliate themselves with such Chapters as a precedent condition of becoming members of the Institute. The Committee, therefore, solicit communications upon the subject from all persons interested, which communications can be sent to any member of the Committee or to the Secretary of the Institute.

Alfred Stone, *Secretary.*
65 Westminster St., Providence, R. I.

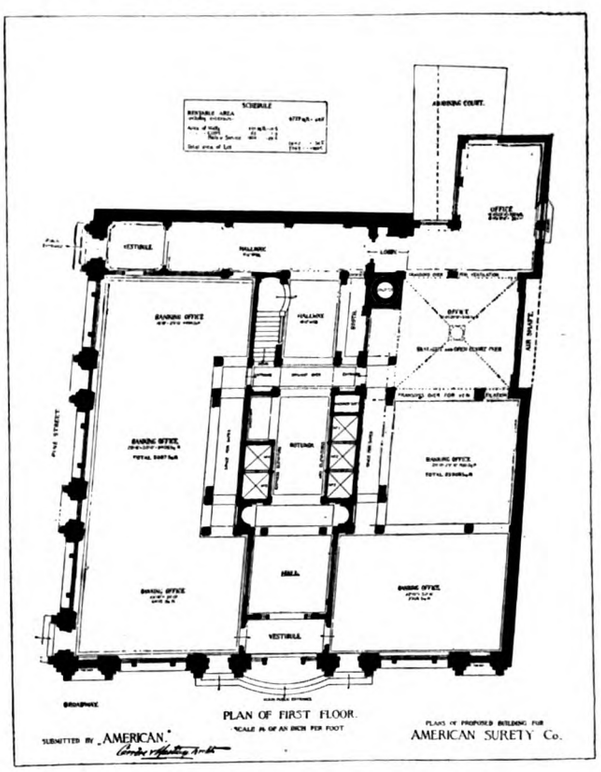
ILLUSTRATIONS

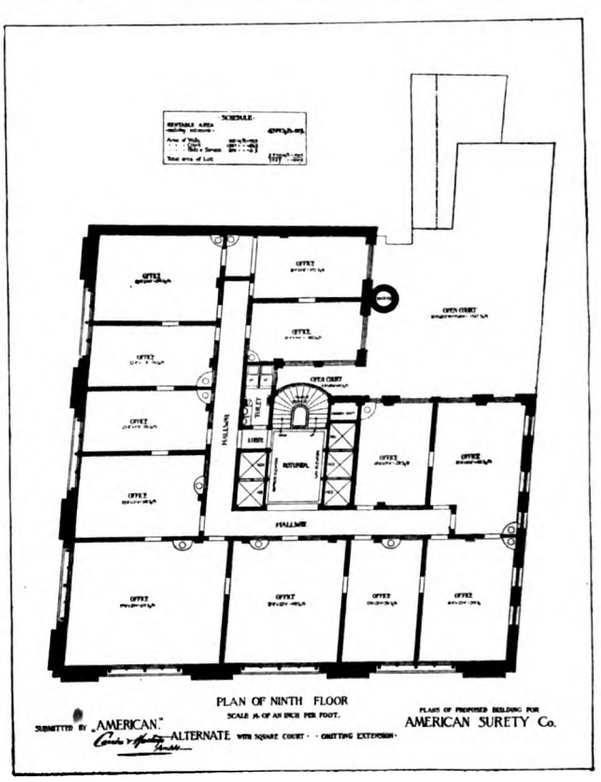
[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

INTERIOR OF THE HOWARD MEMORIAL LIBRARY, NEW ORLEANS, LA. MESSRS. SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS, BOSTON, MASS.

[Gelatine Print, issued with the International and Imperial Editions only.]

COMPETITIVE DESIGN FOR THE AMERICAN SURETY BUILDING, NEW YORK, N. Y. MESSRS. CARRÈRE & HASTINGS, ARCHITECTS, NEW YORK, N. Y.





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HOUSE FOR MR. ———, CHICAGO, ILL. MR. F. R. COMSTOCK, ARCHITECT, HARTFORD, CONN.

VENTFORT HALL, LENOX, MASS. MESSRS. ROTCH & TILDEN, ARCHITECTS, BOSTON, MASS.

COMPETITIVE DESIGN FOR THE SWEDISH E. L. CHURCH, BROOKLYN, N. Y. MESSRS. J. G. GLOVER AND H. C. CARREL, ASSOCIATED ARCHITECTS, NEW YORK, N. Y.

[Additional Illustrations in the International Edition.]

WASHINGTON STATE BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. WARREN P. SKILLINGS, ARCHITECT, SEATTLE, WASH.

[Gelatine Print.]

THE GERMAN GOVERNMENT BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. HERR JOHANNES RADKE, ARCHITECT, BERLIN, PRUSSIA.

[Gelatine Print.]

NEW WING, NORTH INFIRMARY, CORK, IRELAND. MR. ARTHUR HILL, B. E., M. R. I. A., ARCHITECT.

THE addition to this building which we illustrate in the present number has been erected from funds bequeathed by the late Lady Combermere as a memorial to her father, Dr. Gibbings, who was for many years connected with the institution.

The difficulty attending the arrangement of the building on the extremely limited site at the disposal of the trustees, in such a manner as would not overshadow the old building, and at the same time to maintain perfect lighting and ventilation of the new wards, led to the adoption of rounded ends to all the new portion. The result has been very satisfactory as regards the free access of light and air to every window.

The walls are brick and cement, built hollow, and faced with the South Buckley Company's buff facing-brick and Portland-stone dressings. In addition to the specially-made curved bricks, three-quarter moulded bricks were also specially made for the window-jambs, to avoid cutting. The floors are concrete and iron joists with tongued red-pine boarding in the wards and marble-mosaic floors in the other portions. The roof is constructed in a similar way and covered with asphalt, forming a valuable airing-ground, part of which is under glass for the patients.

INTERIOR OF THE SAME.

PLANS OF THE SAME.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

THE NEW YORK CITY-HALL COMPETITION.

ST. LOUIS, MO., February 8, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In the third or fourth number from this last, you gave the report regarding the New York competition, stating the number corresponding to those that were favored. I find nothing in the *American Architect's* last two numbers regarding this, with the exception of an advertisement in care of some lawyer, I suppose, in New York, to the effect that all architects interested in the New York competition should refer to him. I also notice in the *Engineering Record*, something to the effect that the New York Commission have dismissed the competition entirely. Of course, such proceedings would be a violation of their contract, which they certainly have entered into with all architects going into competition. As I have heard nothing else, will you be kind enough to advise me at your earliest convenience, what the Commission are doing and have done in this matter and also what position the above party takes, and greatly oblige, Respectfully yours, MISSISSIPPI.

[THERE is little that can be said as to the status of the New York City-hall competition, in spite of a good deal of foolish and foundationless statement that has appeared in the daily papers. The competition has as yet neither been decided nor abandoned and competitors have a right to complain only of the delay. Certain architects, who refused to enter the competition because they were unwilling to accept the compensation offered in the original programme, are now anxious that the present competition shall be abortive and a new one instituted with terms more to their satisfaction, and a considerable part of the newspaper discussion doubtless is colored by opinions which have been expressed by these malcontents. The Building Commission have clearly misunderstood the real tenor of the report of their architectural advisers, who have submitted a statement which declares that the competition has been carried out exactly on its stated lines and has resulted exactly as such a competition was expected to result — not in the discovery of a single preëminently suitable design, but in proving that there were half-a-dozen designs of sufficient initial merit to make it probable that one or more of their authors might safely be intrusted with remodelling for execution his original design or preparing an absolutely new design based on more precise instructions. The Mayor and the Building Commission expressly informed their architectural advisers, at the time the programme was being prepared, that they did not wish the competitors to be hampered in their efforts by having to meet a stated total cost, and that unless the anonymety of the designers was made inviolable there was no possibility for the authorities to escape charges of trickery and collusion. Such official and unofficial complaints, then, as contravene these two statements are wholly inexcusable. We believe fully that no one, competitor, expert adviser, official or newspaper reporter, knows the names of the six competitors whose designs have been reported with a qualified favor. — EDS. AMERICAN ARCHITECT.]

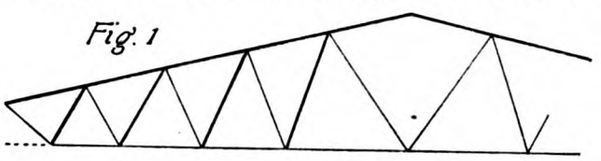
WANTED: AN EXPLANATION.

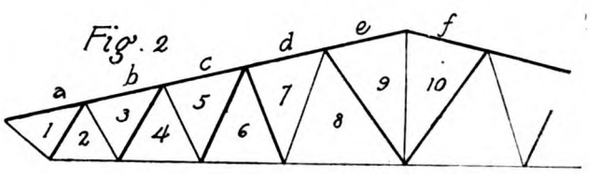
SAN FRANCISCO, CAL., January 21, 1894.

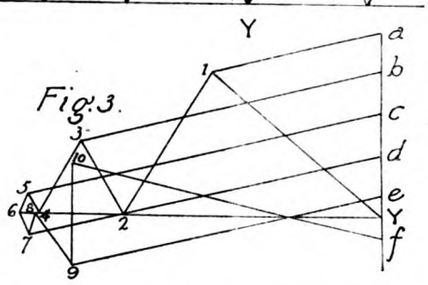
TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I have taken it upon myself to study graphic statics with no other teacher than your "Office-help" column and "*Trussed Roofs*" by Ricker. Upon seeing a form of truss that is new to me employed in a structure, I generally attempt to make a strain-sheet of the same.

Through your kindness, would like to beg for information of some of your readers as to how to ascertain by diagram what it is that lends stability to the truss as shown in Figure 1, which is a form of







truss that I ran against. To me it is not in equilibrium. Should it not be like Figure 2 of which Figure 3 is an attempt at the strain diagram for same?

The upper and lower chords are composed of two pieces of 2″ x 8″; the lower chord being continued as per dotted line, the struts are of 2″ x 6″ and the tie of round iron rods. The span is about 40′ 0″. Yours truly, J. G. HULT.

NOTES AND CLIPPINGS

TRADES UNIONISM IN FRANCE. — A report on French trade-unions has just been published in the *Journal Officiel*, but the statistics do not extend back farther than 1884, when there was 175 trade-unions regularly constituted, 101 of which were masters' unions, 68 workmen's unions, one mixed, and five agricultural. Each year since then has seen a steady increase until, on July 1, 1893, the total number amounted to 4,448, of which 1,397 were masters' unions, 1,926 workmen's unions, 173 mixed and 952 agricultural. The increase of membership has been equally marked. Thus from July 1, 1892, to July 1, 1893, membership in trade-unions increased by 176,156. Of these new associations, 27 were of physicians and midwives, who were allowed to benefit by the law of 1884 only by the special provisions of a bill passed in November, 1892. The number of mixed unions has rapidly fallen off. Unfortunately, the report contains no information concerning the course of the unions in relation to strikes, nor is anything said of the trade-unions which have been dissolved in consequence of their neglect to deposit a list of members in accordance with law. Among the satisfactory features of the report may be noted the increase in registry-offices and the establishment of orphanages and museums. — *N. Y. Evening Post.*

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The Growth of the Population of London. — The favorite name of Cobbett for London — "the wen" — is going to be truer than it ever has been, if we can trust some remarkably interesting statistics just issued by the London County Council. One question discussed is whether London is or is not being checked in its rate of growth. On a first glance at the Registrar's figures with regard to London itself, it appeared as though it were, for before 1881–'91 London population was increasing every ten years at a rate varying from 16 to 21 per cent, but in the decade ending with 1891 the rate of increase had only been 10 per cent. "Does this mean," asks the committee, of which Mr. Costelloe is chairman, "that London has reached the turning-point, and that in a few years the increase will become a decrease?" The committee finds that it does not. It appears that the true reason for the apparent diminishing rate of increase is that the building-space in London is gradually being appropriated, and that the people, aided by improved railway and tramway and omnibus accommodation, are betaking themselves more to outside London residences. Even in Greater London this is noticed to a smaller extent. The rate of increase in population, while still very rapid in Greater London, is beginning to show a tendency to become slower, and it is discovered that the Londoners are moving still farther out into the home counties. Then there are speculations as to what the size of London will be fifty years hence, or less, upon the milder suppositions. If we do not add any more to the population than the amount per decade that has been added since 1881, it seems that we should have a population in 1941 of close upon 10,000,000. If we allow for a growth at the rate of the natural increase of births over deaths, there will be nearly 11,000,000 in London in that year. If we reckon that London will grow at the average rate of the last three decades, we shall be over 14,000,000; but, if inner London and outer London go on together growing at the rate they have been growing for the past three tens of years, we are to expect a London population in 1941 of a trifling 17,500,000. If we look at the matter in another way, and ask what population Greater London will contain when it has attained throughout the mean density of well-known areas, we get the following appalling circulation:

If Greater London were peopled only as densely as Hampstead, it would contain a population of	13,000,000
If it were peopled on an average as densely as Fulham is now, the population would be	20,000,000
If it were peopled at the rate of St. George's, Hanover Square, the total would rise to	30,000,000

Whitechapel is now three times as densely peopled as St. George's itself. The moral is obvious. — *The Westminster Budget.*

The Prairie Sod House. — "The sod house of the Kansas and Nebraska plains is following the buffalo and antelope into the land of legends," said William F. Arbuckle of Topeka. "A good many of the queer structures are still standing, and in some instances are yet used as human habitations, but most of them are utilized as stables for horses or cattle and are slowly crumbling away to become indistinguishable in their original earth. When I first went West, years ago, my father took up the acres as far as his eyes could reach in what is now eastern Nebraska. There was not a tree in sight of the knoll he had selected as the spot upon which his residence should be erected, and the nearest place lumber could be secured was sixty miles away. He put up a small tent in which to cook and eat — the family slept in the wagons — and, with my brothers and hired man to help, set about making a house. The thick sod was cut from the prairie in slabs about two feet wide by three in length, and on the side of the knoll, where an excavation had been made in its side, these slabs were placed, one on top of the other, until the required height was reached. It was arduous work, and I remember what a lot of excitement there was when my father and my brother Lem started off early one morning to go after the ridge-pole and rafters that were to support the roof. They took only the running-gear of our small wagon and I cried like a good fellow when they started off because I thought they had broken up my pet vehicle. They were gone nearly a week and reached home in the middle of one night after their journey of 120 miles. They had brought a long, round piece of timber, like a slender telegraph pole, with numerous other smaller pieces, and my mother nearly had a fit of delight when they proudly displayed a door and two window sashes, with a bundle of glass for the latter. There was great rejoicing when that ridge-pole was put in place and the rafters run down from it to rest on the sod walls, and then came the laborious task of putting on the sod roof so that it would keep out the rain and snow. At last it was completed and we moved in. The house had four rooms, which was unusual for such structures, and its two windows soon made it known all over that section of the West as the "Shack with the Glass Eyes." There never was a more comfortable building erected than a sod house. They are not all damp, as one would suppose, and are warm as you could desire in winter, while in summer they are the most delightfully cool places imaginable. But they are rapidly disappearing now, and when you see one you are sure to find near it a modern cottage with its windmill just as you do out at our place.— *Washington Post.*

A Straw Bridge in Texas. — A Texas journal describes a straw bridge which has been built across the Red River, seventeen miles from Quanah, Hardeman Co., Texas. The bed of this river is very wide, and is said to consist of a very fine red treacherous sand, making heavy hauling impossible. The bridge is really a causeway, three miles long, about five feet high, and wide enough for two teams, and appears to have been constructed by a settler, who charges a small toll for its use. It is built of alternating layers of long grass and sand, and is rebuilt every season, as the high water washes it away. An attempt has been made to build an iron bridge, but it was washed away almost immediately, and, it is stated, the natives find the straw bridge better as well as cheaper. — *Invention.*

Boston's Fire-loss for 1893. — Superintendent Samuel Abbott of the Protective Department states, that the total fire-loss in Boston during 1893 will reach $4,950,000. The normal annual loss by fire in Boston is $1,000,000. The city suffered a loss of $3,000,000 in the great fire on Lincoln Street last March. — *Boston Transcript.*

A Cincinnati Cathedral. — The erection of a Protestant Episcopal Cathedral in Cincinnati seems about to be realized. At a recent meeting of the various church vestrymen with Bishop Vincent, earnest discussion was had of the long-cherished project, and practical steps taken to secure a suitable site, together with architectural plans for a structure to cost not less than $2,000,000. — *The Evening Post.*

German Superstitions about Stones. — An entertaining chapter on minerals, and the popular superstitions connected with them in Germany, is contributed to *Die Natur* by Friedrich Klinkhardt. Children under the age of one may not play with stones, otherwise bread will be scarce. An ill omen may be made innocuous by throwing a stone into the road before taking the next breath. Chalk is credited with many virtues: Cows marked all down the spine with chalk consecrated at Epiphany remain healthy, and always find their way home. Alabaster in water is used for curing sick children in Bohemia. A flint pebble from the brook, if thrown over the roof into the poultry-yard, encourages the hens to lay eggs. The beliefs connected with "thunderbolts," which are sometimes flint instruments, or quartz crystals, or lightning tubes, are exceedingly numerous: in the Palatinate it is believed that thunderbolts, after penetrating seven yards into the ground, rise a yard every year. This reminds one of Miolnir, Thor's hammer, which returned to his hand. — *N. Y. Times.*

The Wealth of Australia. — In the course of an address delivered the other evening before the Royal Colonial Institute, in London, Miss Flora Shaw said: "Wealth is the distinctively, to some people the objectionably, modern characteristic of Australia. Whatever some financial critics may say — and I am trying to-night to avoid the introduction of a single figure — the wealth of the continent is simply prodigious. It is not that she has a Mount Morgan mine in which gold seems at a far distant period to have been thrown up from some underground store almost as freely as the water of the Charleville bore is leaping up to-day. It is not that she has a phenomenal horse shoe of silver at Broken Hill, from which something like one-fifteenth of the annual silver output of the world is produced, or that, if all late reports are true, she has a scarcely less remarkable third marvel in the copper deposit of Mount Lyall, in Tasmania. It is not that throughout the old rocks of the coast range coal and tin and the more homely minerals alternate with abounding gold; that fresh beds of mineral wealth are being opened every day; that diamonds and rubies, topazes and emeralds are scattered through her hills; that even in the sandstone plains of the interior, where no gems were looked for, opals wait to be picked up; or that the warm waters which wash her shores bring pearls and coral in their waves. These are mere incidents in her good fortune. Her true wealth lies in the common earth. As with her political, so with her natural history. The virgin continent has spent herself in no efforts in the past. She has produced neither the varied vegetation nor the immense mammalia of the prehistoric periods of the northern hemisphere; but, isolated by the oceans which surround her, she has remained apart from the general evolution and reserved herself wholly for futurity. The savage races which haunted her western forests had no message of life for her. She has waited for the best that history has produced, and now at last, wedded to cultivation, she seems destined to become the fruitful mother of the wealth of half a world."

Successful Test of the Hydraulic Tunnel at Niagara Falls. — The first practical test of the great hydraulic tunnel, which has been under construction at Niagara for the last three years, was made at 11 o'clock, January 25 When the gates were raised at the entrance to the feeder, leading from the big hydraulic canal to the wheel-pit of the Niagara Falls Paper Company's mill, the waters of the upper river rushed through their new-found channel to the wheel-house, where they poured down the penstock of the pit, a hugh iron structure, thirteen feet in diameter, for a distance of 155 feet, then striking in an upward direction three of the largest turbine wheels ever built, and thence passing into the big tunnel, and flowing out under the city to the river below the falls, nearly two miles distant from the point of the fall. This test shows what many thousands have been waiting to see — a practical demonstration of the great scheme for harnessing the terrific power of the Niagara — a scheme which has already cost nearly $4,000,000. The paper-mill, which is the first to get the benefit of the power, is the largest of its kind in the world. Its contract calls for 6,600 horse-power, one-half of which is being used now, and the cost, including the lease of the land occupied by the mill, is $8 a horse-power a year for twenty-four hours a day, the cheapest, it is said, ever obtained. The test proved a satisfactory one, and the mill is now in full operation. The hydraulic tunnel, with a capacity of 120,000 horse-power, is a success, and now there remains only the formal opening of the general power-house, where 5,000 horse-power turbines will operate 5,000 horse-power electric generators for the transmission of power in this form. This opening will take place on June 1, and it is intended to give the affair a celebration at which distinguished scientists, engineers and State officials will be present. The test was made in the presence only of the officials of the paper-mill and of the R. D. Wood Company, of Philadelphia, who built and placed the machinery in position, and Prof. Geyeliu, the designer of the turbines used. The first water drove one of the three turbines until 1 o'clock, then the second was turned on and a third at 2 o'clock. The public were not acquainted with the fact until an hour later, owing to the desire of the company to make all possible allowances for newness of machinery, etc. Not a hitch was made, however, and everything ran as smoothly as could be desired. — *N. Y. Tribune.*

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RESIDENCE FOR MR. ———

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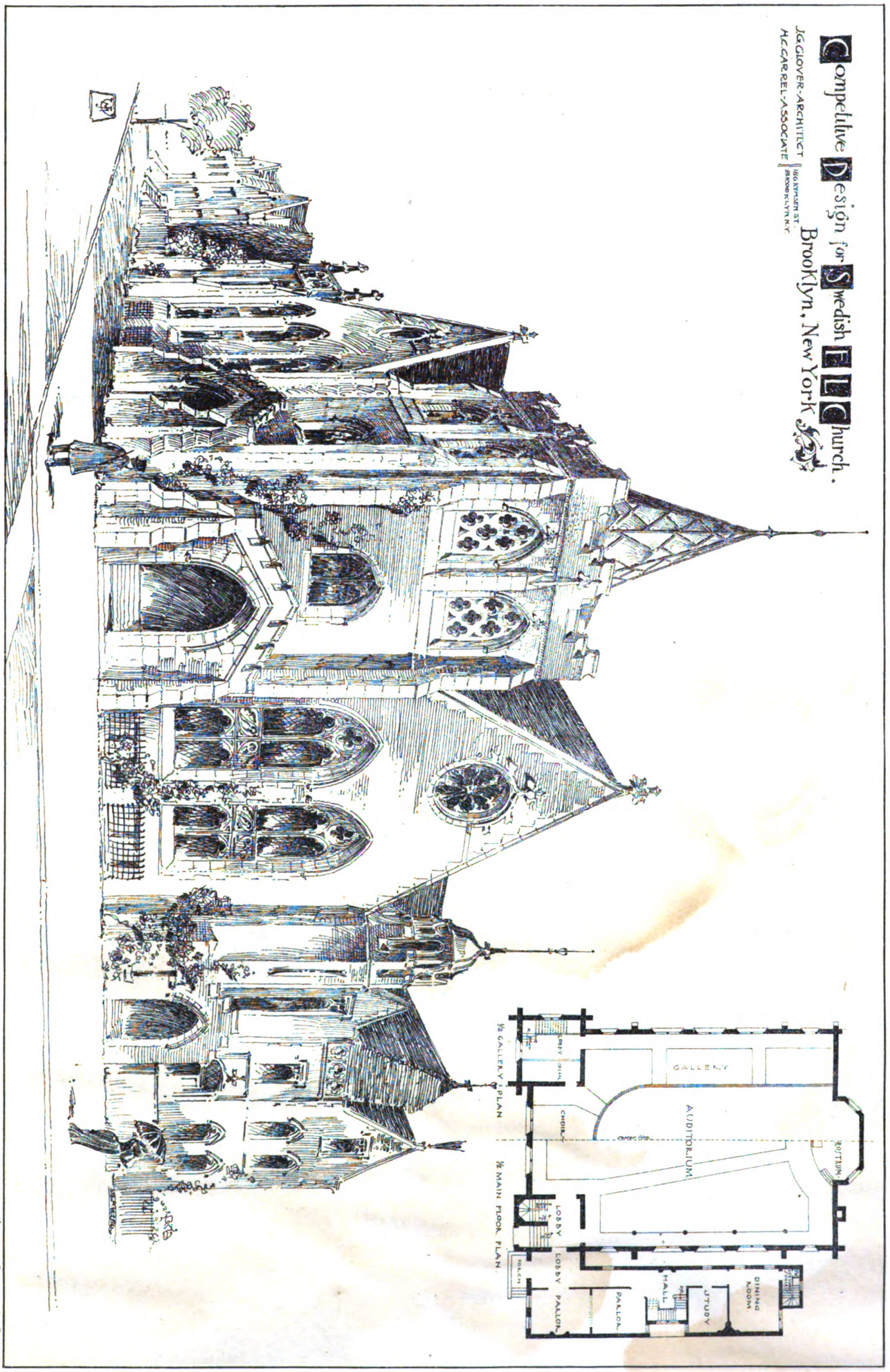
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Competitive Design for Swedish Church.

Brooklyn, New York.

J.G. GLOVER - ARCHITECT
H.C. CARREL - ASSOCIATE
180 REMSEN ST. BROOKLYN, N.Y.



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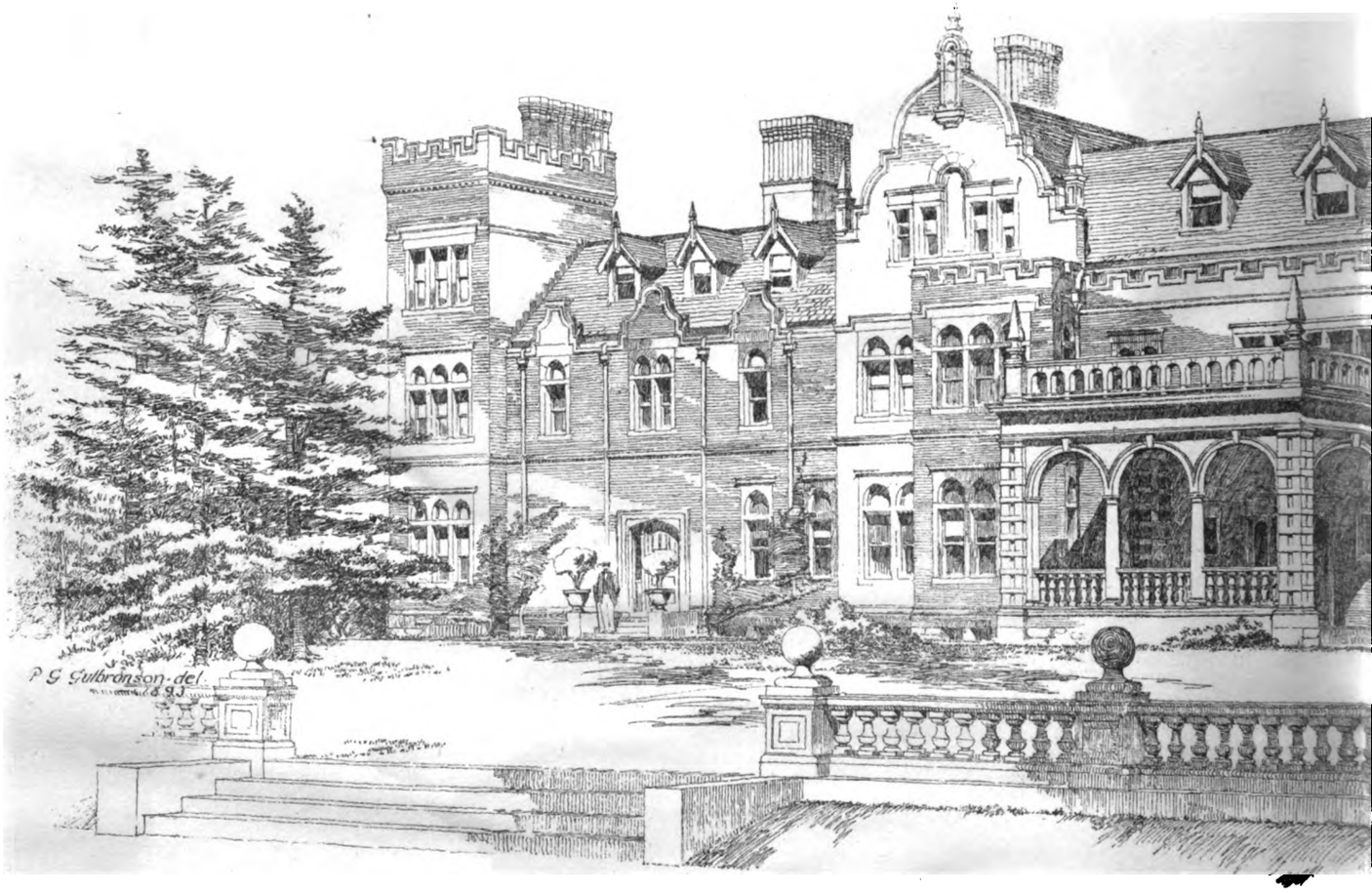
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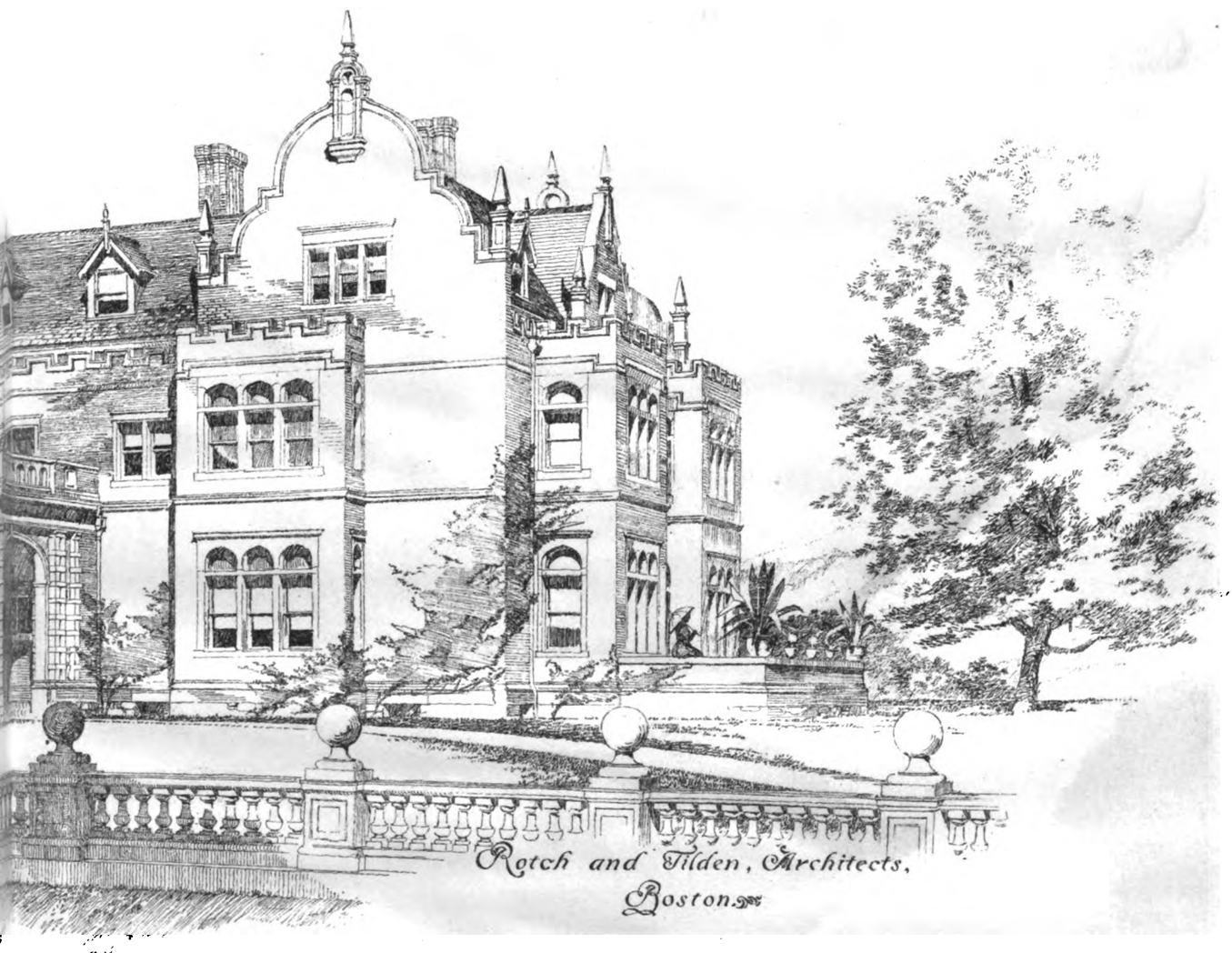
Bentfort Hall,

Lenox, Mass.



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THE ARCHITECT & BUILDING NEWS



Rotch and Tilden, Architects,
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BROADWAY ELEVATION.

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PLANS OF PROPOSED BUILDING FOR
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THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XLIII

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FEBRUARY 24, 1894.

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THE *Record and Guide* points out the great advantages which present conditions offer for building, particularly in New York. Not only is land cheap there, as compared with its ordinary value, but materials of nearly all kinds can be bought at prices ranging from five to twenty-five per cent lower than those current last year, which were then considered very low. Structural iron is officially quoted at prices lower than ever before, and it is currently understood that contracts can be made for it at prices under the market quotations. Bricks cost, in New York, only about two-thirds as much as they did last year, and spruce lumber about three-quarters. The only element in the cost of building which nominally maintains its price is labor, but, although the walking-delegates fiercely resent the idea that any reduction of wages is probable, this does not prevent such men as can find employment from working with unaccustomed diligence and care, in order to keep their places, so that the result is practically the same as that of a substantial reduction of wages. With all these advantages on his side, the *Record and Guide* thinks that the investor or real-estate speculator will not for many years be able to use his money to such advantage as now, and we take pleasure in finding the opinion which we expressed some weeks ago confirmed by so eminent an authority.

THE current number of *Architecture and Building* contains an editorial, headed "Allies in New York's Dishonor," and devoted to matters connected with the competition for the new City-hall, which we cannot approve, and representing, we hope, some portion of the profession, we would like to disclaim, for that portion, any participation in the sentiments expressed in it. The editorial in question accuses the Mayor of making "efforts to prostitute the city's honor in making a fiasco of the competition for the new City-hall, with the probable after-result of throwing the whole thing into politics"; and it denounces the New York *Times*, *Tribune*, *Herald*, *Mail and Express*, the *Record and Guide*, and various persons and associations, for "supporting" the Mayor in his "effort to squash the competition." So far as we know, there is not the slightest reason for supposing that Mayor Gilroy desires, or ever has desired, to act otherwise than fairly in the matter; and the idea that he or his friends could be benefited politically, either by throwing away the chance of securing for the city one of the most splendid buildings in the world, or by alienating a great body of architects, artists and fair-minded citizens by any underhanded rascality, seems to us too absurd for consideration. In the same way, the accusation that the people who think that the old City-hall, and the Park, ought to remain as they are, express that opinion simply for the purpose of "playing into the Mayor's hands," is unworthy of serious attention. In point of fact, the only rumors of unfair and dishonorable action in the matter that have come to our ears, which seemed either well-sustained or plausible, have related to the architects themselves. It is a matter of history that some of these, who were not personally concerned in the competition, have interfered in the affair in a way which, as they must have known, may seriously affect the interests of those of their brethren who were participants; and stories are in circulation which indicate that one or two, at least, of the competitors have endeavored to push their own cause by very questionable means. It cannot be too often repeated that architects must not expect to be treated by persons outside the profession better than they treat each other; and if architects choose to take the lead in discrediting or defrauding their brethren, they need not complain if the public follows their example.

LE GENIE CIVIL gives an interesting account of the seashore hospitals of Europe, particularly of France, written by M. Henri Mamy. It has long been a part of popular medical knowledge that scrofula, by which is generally meant a constitutional derangement, showing itself sometimes by eruptions on the skin and sometimes by the feebleness and deformity known as "rickets," although not itself very fatal, conduces strongly to fatal tuberculous diseases. In fact, M. Mamy says that French medical statistics show that out of the annual average of 800,000 deaths, 172,000 are due to tuberculous diseases; and that about forty-one per cent of those who die from tuberculosis have previously had scrofula. According to these figures, seventy-three thousand people die every year, and many thousand more are crippled or made helpless, from scrofula; yet scrofula is not only curable, but easily curable, as the French physicians think, by a regimen in which the breathing of pure air forms much the largest part. For the purpose of applying this regimen to those who need it most, — the children of poor families, who cannot afford fresh air or healthful surroundings, — nearly all European countries have established seashore hospitals, devoted to this class of patients. Italy, with a population of only about twelve millions, supports twenty-six of these hospitals; England has five or six; and France has fifteen. The latter country possesses the great advantage of extreme diversity of climate, and the manner in which the patients of different classes are assigned to establishments suited to their condition is interesting. It is hardly necessary to say that patients in whom tuberculosis, either pulmonary or visceral, is actually developed, are not sent to seashore hospitals; but the damp atmosphere, which would generally be injurious to them, is found to be extremely beneficial to those in whom the diseased condition has not progressed beyond the scrofulous or rickety stage. Among the French hospitals, those on the north coast are found to suit feeble and anæmic children, who, if taken there at the age of a year or a year and a half, when rickets usually makes its first appearance, gain strength with marvellous rapidity, and, if allowed to stay long enough, are almost always permanently cured. The hospitals on the west coast, where the air is warmer, but extremely moist, are found to suit nearly all scrofulous patients, but particularly nervous and impressible children. As a rule, patients with any trace of pulmonary tuberculosis are not sent there, but there is an establishment at Arcachon, which is buried in pine forests, and so sheltered that even consumptives may do well. The third class of hospitals is situated on the Mediterranean shore, and these are found particularly favorable for nervous and excitable subjects, and for those the condition of whose lungs is in doubt. M. Mamy says that an essential element of success is that the treatment should be prolonged. One or two years is necessary for complete cure; and it is found that a continuous sojourn is much more effective than short, repeated visits. It certainly seems as if this admirable example might be followed here. We have a range of seacoast climate quite equal to that of France; our mortality from tuberculosis is, proportionally, about the same, and we have just as much affection for our children, and more money with which to show that affection. Nearly all the seashore

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hospitals in France have been built, and are maintained, by private generosity, and among the names of their benefactors those of women are most conspicuous.

A RECENT decision shows that the French courts take a curious view of an architect's contracts with his employer. An architect, named Avezard, was engaged by one Bosquet to carry out certain work. Whether Bosquet and Avezard had any preliminary discussion as to the fees to be paid to the latter does not appear, but, in the contract between Bosquet and the builder for the erection of the structure in question, a clause was inserted, which said that it was "mutually agreed" between Bosquet and Avezard that the latter should be paid five per cent on the total cost of the building, as estimated by Avezard, without deducting the contractor's discounts; and that a similar commission should be paid on extra work, reckoned in the same way. This contract was signed by Bosquet and the builder, but not by Avezard. It will be remembered that, in France, the preliminary estimates are always made in accordance with an official price-list, covering all the details of building work, valued at maximum rates, and contractors, instead of offering to do the work at a lump sum, often make their tenders in the form of a discount, which they propose to make from the official price-list, and which, in practice, often reaches twenty-five or thirty per cent where the conditions are favorable for building cheaply. It is obvious that, under these circumstances, to calculate the architect's commission on the gross estimate, without deducting the discount, or "rabais," is equivalent to adding one-third or one-half to his fees; and if the architect is allowed to make the rough estimate on which his fee is based, the addition may be still larger.

BOSQUET died while the work was going on, and, after its completion, Avezard sued his heirs for a balance of commission which he alleged to be due him, amounting to 3,510 francs. He had been paid 7,000 francs, and it was proved that the total cost of the building was 128,320 francs. The Bosquet heirs maintained that Avezard had been overpaid, and they alleged, moreover, that he had not delivered to them the plans and papers relating to the building, as it was his duty to do, so that he had not fulfilled his contract with them, and, being himself in default, could not require payment, even if anything were due him. Avezard rested his claim on the contract, signed by Bosquet, and said that he was ready to give up the papers relating to the building when his bill was paid. The Tribunal of the Seine made several interesting rulings. In regard to the clause in the contract, fixing the fees to be paid, it said that, as it was signed, in connection with the other portions of the building-agreement, by Bosquet, but not by Avezard, it was not binding between Bosquet and Avezard. "But," continued the Court, "even if the said clause, . . . inserted in the strangest fashion in the building contract, in the place where should be found a clause relative to the mode of payment to the contractors . . . had nothing suspicious about it, and had been regularly signed, as a clear and definite agreement, both by Bosquet and Avezard, it could not form an obstacle to the sovereign right of the Tribunal to regulate and fix the fees of Avezard, who is only a salaried agent." The Court explained that the law, in giving to the tribunals the right to fix the compensation of an agent, keeping in view his care and trouble, and the importance of the service rendered by him, even though the agent might have stipulated in advance for a fixed compensation, and received promise of payment in accordance with his stipulation, intended to protect the interests of those who, finding themselves engaged with agents disposed to exaggerate their personal merit, and the importance of their services, had been unable to resist successfully the demands made upon them. This principle, the Court thought, was applicable to the case of Avezard. According to his own statement, he had based his claim for commission on an estimate nearly double the actual cost of the building, and the Court said that it was evident that an architect could not be permitted to calculate his fees by a system which would authorize him to fix them arbitrarily, since he would only need to make estimates much too large to arrive at the most exaggerated standard of compensation. Taking into consideration, therefore, the actual cost of the building, on which the Court thought that five per cent commission should be allowed, and adding something for expenses and extra time spent, the total sum properly payable to Avezard was found to amount to 7,252 fr. 92 c. which, as the Court said, was enough to pay him honorably. Of this, 7,000 francs had been paid, leaving a balance of 252 fr. 92 c., which the Bosquet heirs were ordered to pay, with the costs of the suit, and interest from the date of the writ; and Avezard was directed, when this payment was made, to deliver to the Bosquet heirs the papers relating to their building, but was instructed that he need not do so until the money was paid.

AT a recent meeting of the American Chemical Society, in Baltimore, a paper was read on the subject of expert testimony by chemists in criminal cases, which strikingly confirms the views which we have long maintained in regard to such testimony in building cases, and which Mr. Tidd lately presented, in a very forcible manner, as applied to the expert testimony of engineers. According to the writer of the paper before the Chemical Society, who has had experience in such matters, it is very desirable that, in murder trials, the expert witness or witnesses, upon whose testimony the case frequently turns, should be summoned by the court, and should make their report to the judge, instead of being engaged by the lawyers on either side. The writer says, just as we said recently in regard to building or engineering cases, that criminal lawyers consider that the expert belongs to the side that employs him, and that his testimony must be made to fit their theory of prosecution or defence; and we need not add that if they can contrive to make it do so by misleading him a little as to facts outside of his own knowledge, they will sometimes take advantage of his want of caution. More than this, however, the writer of the paper says that experts, in his experience, are only allowed to answer the questions put to them, and, unless it can be brought out in reply to a direct question, they may be unable to give information which would materially modify the impression produced by their testimony. We have called attention to the fact that lawyers, by skilfully worded questions, generally contrive to get from an expert, even against his will, answers which will confirm the impression that they desire to make; but, in most courts, experts are privileged witnesses, and would be allowed to qualify, even without a direct question, testimony which without such qualification would be misleading. Our writer, however, gives an instance where, in a murder trial, an expert chemist, who had analyzed the contents of the stomach of the victim, and had found therein zinc and arsenic, was called upon to testify to having found the arsenic, but was not allowed to mention that zinc had been found with it. The body had been embalmed after death, and, to a chemist, there was no doubt that the zinc, and, very probably, the arsenic, had been injected into the body after death, as components of the preservative fluid used by the embalmers. To have testified to the presence of zinc and arsenic together would probably have led to inquiries, on cross-examination, the result of which would have been favorable to the person accused of the murder; but the expert was engaged for the prosecution, not the defence, and he was only allowed to say just enough to give the jury the impression, which he probably did not himself share, that the arsenic had been feloniously administered to the victim, in order to cause his death. Decent people will probably think that a prosecuting attorney who would deliberately suppress and distort the truth in this manner, in order to secure the conviction of a person who, if all the truth were allowed to be told, might be acquitted, was little less than a murderer himself; but prosecuting attorneys like to gain their case as well as the attorneys for the defence, and honorable scruples about the means to be used for accomplishing this result are not generally more noticeable on one side than the other. Our chemical writer, speaking from his observation, says that "A reliable chemist, brought into a murder trial by the court, for the express purpose of finding out the truth, whoever might be affected, would serve to bring about a new state of affairs in ordinary criminal trials." The same thing might be said of trials involving building and engineering matters, and it seems to us that all the professions interested ought to combine their efforts without delay to bring about a better system. If the State or National organizations of chemists, physicians, engineers and architects could this year appoint committees to work together in drawing up proper measures for submission to the Legislative authorities, seconding their efforts, perhaps, by addresses to the public, another winter ought to see the reform practically begun, and experience of its benefits should insure its rapid spread.

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PUBLIC SQUARES.[1]—III.

THE BUILT UPON SQUARE.



Fig. 43. Lessing Theater, Berlin, Prussia.

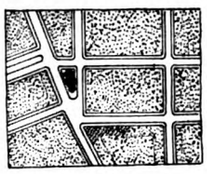


Fig. 44. Trinity Place, Berlin, Prussia.



Fig. 45. Eglise de St. Augustin, Paris, France.

IN the arrangement of a mere fore-square, the sides are not considered when the building stands between others, or they are of secondary consideration when the building is surrounded by mere side streets or alleys.

The building that is located so as to be open or free on several or all sides, so that the architecture may be treated with dignity, stands upon what we have above designated as the "built *upon* square." The requirement of a suitable distance for viewing the structure applies to all the sides, while that of good distant perspective effect can be restricted to the main view.

It is a duty in the laying-out of a city to create suitable positions for the public buildings and their open squares. The necessity of having an open space around a public building is the only excuse for the arrangement shown in Figure 43.

It is not sufficient in laying-out a city to be content with accidental open places that have no axial or artistic relation to the streets, (Fig. 44). An illustration of the use of a similar square as the site for a monumental building is given in Figure 45. In this instance, the shape and arrangement of the square are not left wholly to chance, for by giving the continuation of the Boulevard Malesherbes a



Fig. 46. Place de l'Opera, Paris, France.

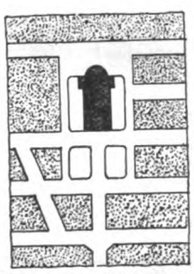


Fig. 48. St. Paul's, Copenhagen, Denmark.

slight inclination in its direction as it enters the square an axial position is thus obtained for the church which can be seen from both near and far.

The arrangement of the Place de l'Opéra at Paris (Fig. 46) is equally effective.

The City-hall Square at Philadelphia (Fig. 47) and the Kirchplatz at Vienna are not so successful as the above cases, because they disturb the traffic. Even the Piazza di Castello at Turin is to be criticised in this respect in spite of its great size, as the building imposes too much restraint upon the traffic.

This defect is avoided in Figure 48, in which the axial position of the church is effected without hindering the traffic, and a view of the architecture from the neighborhood is possible.

Less to be praised is the Zionskirchplatz at Berlin (Fig. 49) and still less the spaces about St. Paul's, London, St. Stephen's, Vienna and others which, although offering a good view from a distance, are still so restricted in size that it is impossible, comfortably to view the building near to.

Examples of squares that are too extensive are not scarce, but the effect of emptiness in such squares may be removed or diminished by furnishing it with plantations and smaller decorative buildings. Such a remodelling of the Belle-Alliance Platz at Berlin has made less apparent the disproportion between the thin column and the immense square. The church in Figure 50 probably suffers in comparison with the large extent of water.



Fig. 47. City-hall, Philadelphia, Pa.

It is evidently difficult in laying-out a city plan to prevent errors of proportion between the square and the buildings that are to be placed upon or around it, as the designer does not know anything of their probable size. Many mistakes, however, will be avoided, if he proportions the square to some suitable buildings as he imagines them. The rest must be entrusted to the commonsense of futurity.

[1] A graduating thesis by T. M. Newton of the Architectural Department of Columbia College, New York. Continued from No 946, page 67.

Examples of beautiful "built *upon* squares" are those on which abut the Madeleine at Paris, the Cathedral at Orleans and the Cathedral at Rheims, all axially located, with extensive open surroundings; in a less degree, the Münsterplatz at Ulm (Fig. 51) and the Münsterplatz at Freiburg (Fig 52) are noteworthy.

The arrangement of three rectangular blocks shown in Figure 53 is not generally advisable and can be adopted only in large cities when enforced by necessity and when the proportions between the

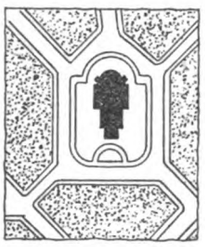


Fig. 49. Zionskirchplatz, Berlin, Prussia.

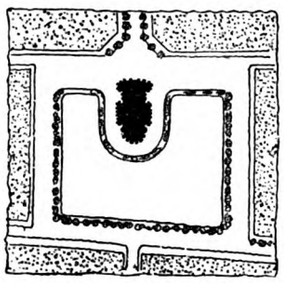


Fig. 50. Johanneskirchplatz, Stuttgart, Wurtemberg.

square and the buildings are as good as in this example. If the garden part of the square were not too much cut-up by the diagonal crossings, and garden plantations were arranged around the churches, the ever-effective contrast between architecture and nature would make this square one of the most beautiful in Berlin.

The "built *upon* squares" are of the greatest decorative value to the city, for they are, more than the others, useful in determining the position of the streets and in forming the terminal points of long lines of sight. In this respect Paris is far in advance of all other large cities.

The Arc de Triomphe, the Opéra, St. Augustin, La Trinité, Notre-Dame-de-Lorette, St. Vincent-de-Paul, the Madeleine, the Strasbourg Station, the Halles Centrales, the Trocadéro, the Church of the Invalides, the Luxembourg Palace, the Odéon, the Panthéon, the Belvedere-des-Buttes-Chaumont and many other well-known buildings form the points of interest, larger or smaller, of one or more street perspectives.

Many of the streets are so picturesquely arranged that the terminal feature is seen only over intervening groups of houses. Beautiful examples of this are the Boulevard St. Michel, which, seen from south to north, leads the eye across the Seine to the Palais de Justice, over which rises the *flèche* of the St. Chapelle; and the Avenue Friedland which has in its axis prolonged the cupola of the Church of St. Augustin.

Paris is particularly rich in architectural compositions, frequently made more effective by placing the buildings on elevations and often in relation to plantations lying lower. Examples of this last are the Madeleine, La Trinité, St. Vincent-de-Paul, St. Sulpice, St. Clotilde, the Trocadéro, the Sacré Cœur and others.

Another instance of beautiful indirect street perspective is the view of the Houses of Parliament from Whitehall Street, London.

In street perspective, proportions must be carefully considered. Long and broad traffic streets cannot be directed towards small decorative buildings or statues without weakening the effectiveness of the latter.

Mediæval buildings especially do not require extensive open places around them — in this respect both the Cathedral at Milan and Notre Dame at Paris suffer.

The "Built around Square." — These squares do not require long street views leading from them. They are in themselves artistically

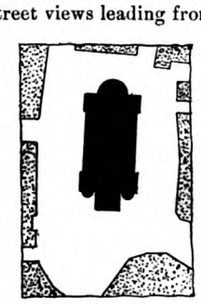


Fig. 51. Munsterplatz, Ulm, Wurtemberg.

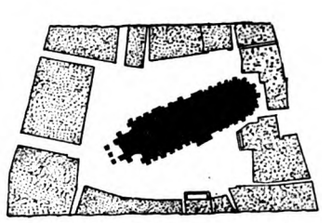


Fig. 52. Munsterplatz, Freiburg.

effective where there has been provided a comprehensive view, good sky-lines and an enclosing frame of pleasingly-grouped and correctly-proportioned buildings.

Regularity of shape is not a necessity, as shown by many monumental squares, but the irregularity must be a growth founded in the nature of things and neither arbitrary nor designed. Then an irregular square may be even remarkably beautiful and picturesque. The relation of heights is of great importance. A square that has

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a decided slope or is very warped does not adapt itself to being built around by monumental structures. It is possible to use the higher side for a monumental building, the sloping square being treated as a terraced and planted fore-square to it; but the three remaining sides are not proper sites for monumental structures.

Slight inclinations, like the designed sinking of the centre of the oval in front of St. Peter's, Rome, are not objectionable, but the artificial raising of the centre should not be attempted.

An architectural square needs a frame: a place which is open on all sides to radiating streets, or which is enclosed merely by fence-walls or plantations, does not give

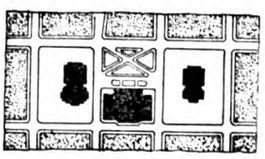


Fig. 53. Gendarmen-markt, Berlin, Prussia.

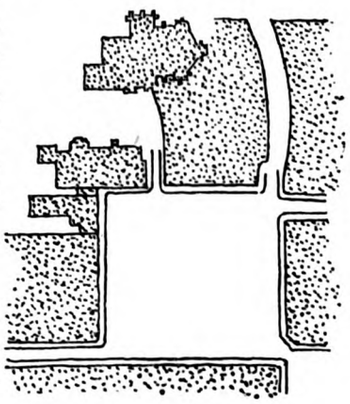


Fig. 54. Groote Plaats, Veurne, Belgium.

the impression of an architectural character, but only that of an unrestful street-crossing or street-enlargement. The square must be surrounded by buildings in such groupings as to give a balance to the masses, and at the same time variety and unity. The entering streets are features of secondary importance to the buildings and when necessary their entrance to the square should be concealed by a grille or portico. The idea of an architectural frame for a square is derived from the old palace courts.

The square must permit a view of all the surrounding buildings from a desirable distance. The proper proportions of size between the buildings and the squares we shall treat of later. In squares that are too large, the buildings lose in importance and effectiveness, and in those that are too small the distances for properly viewing the buildings are too restricted.

A series of "built *around*" squares are given in Figures 3, 5, 6, 8, 10, 11, 54, 55, 56, 57, 58.

In the Groote Plaats at Veurne, Belgium (Fig. 54), the City-hall and Court of Justice are situated in the corner without axial position. The cathedral rises beyond the square over the low houses which form its framework. It is remarkably picturesque and certainly a growth which cannot be created new in our times.

Figure 3 is closely allied to Figure 5: one corner contains the city-hall with the bourse, through which a passage connects with the outer street; on the long side across the square stands the post-office building, and above the small market-houses looms up the Church of Mary. The well in the centre, a feature lacking in Figure 5, adds much to the beauty of the square.

Similar arrangements are to be found in the Mediæval market-places of many other cities as, at Paris, the Church of St. Gervais and

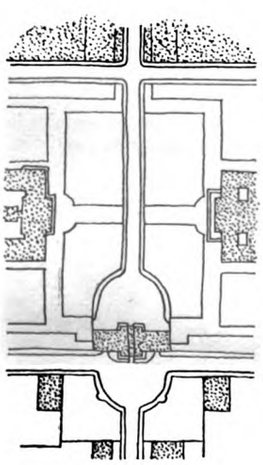


Fig. 55. Konigsplatz, Munich, Bavaria. 120m. x 185m.

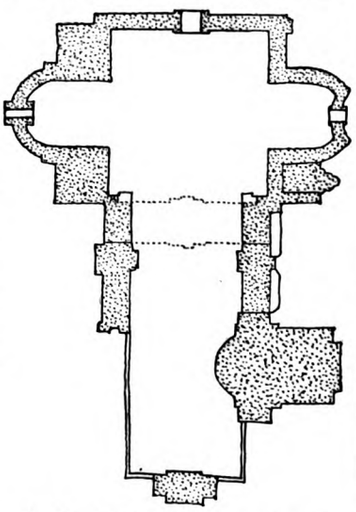


Fig. 56. The Zwinger, Dresden, Saxony.

the Hôtel de Ville; at Rheims, the Cathedral and Palace of Justice; at Orleans, the Cathedral and the City-hall.

One of the best-known and most celebrated of the "built *around* squares" is that of St. Mark's at Venice (Fig. 6), 175 m. long and a width varying from 58 m. to 90 m. It is enclosed by the two council buildings, St. Mark's Church and a part of the Doge's Palace. The main view is directed towards the church which does not stand in the axis. Its unsymmetrical position is not apparent, however, on account of the erection of the Campanile and the celebrated three flag-staffs on the larger of the cross dimensions.

The Piazzetta, sharply cut off from the Piazza by the Campanile, is in reality only a street of approach from the lagoon to the Piazza, but by virtue of the surrounding buildings and the two decorative columns, it is considered as an independent square. Of great beauty and of modest dimensions is the Piazza dell' Annunziata, Florence (Fig. 8). It is surrounded on three sides by arcades. The equestrian statue of Ferdinand I and two beautiful fountain-bowls constitute the decoration. In Verona the small Piazza dei Signori and the roomy Piazza Brà furnish two beautiful examples of the "built *around* square."

The Piazza del Campidoglio (Fig. 10), Rome, by Michael Angelo, is probably the most noble of all. It is trapezoidal in shape, increasing in breadth from the head of the ramp to the Palazzo del Senatore. A steep ramp in the long axis leads up to the square from the Via di Aracœli. At the foot of this ramp are the two Egyptian lions, and at the summit, on the angles of the balustrades, are two colossal statues, in marble, of Castor and Pollux standing by the sides of their horses. Near these, on the balustrade, are the celebrated sculptures called the "Trophies of Marius," and in the centre of the square stands the famous bronze equestrian statue of Marcus Aurelius. On the three sides of the Piazza are the buildings designed by Michael Angelo. The central one is the Palazzo del Senatore, that on the west side is the Palazzo del Conservatore and that on the east contains the Museo Capitolino. The upper balustrades of these buildings are crowned with thirty-two ancient statues. On the right of the ramp a winding roadway leads up to the square,

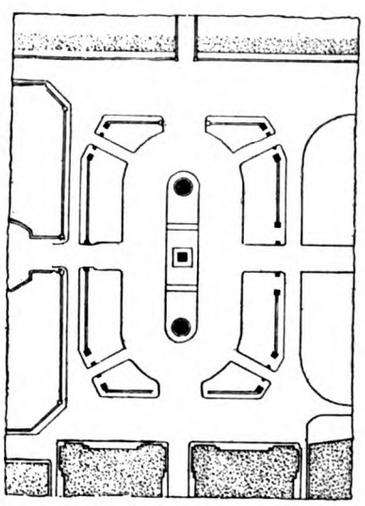


Fig. 57. Place de la Concorde, Paris, France.

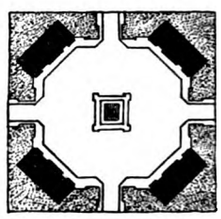


Fig. 58. Amalieborg-platz, Copenhagen, Denmark.

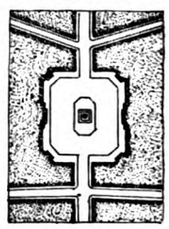


Fig. 59. Place Vendome, Paris, France.

and on the left, the imposing stairway, to the Church of S. Maria in Aracœli.

The Place Stanislaus at Nancy (Fig. 11) is one of the most beautiful in Europe. The city-hall is on the main side, the adjacent sides being enclosed by similar high palace façades, and the fourth side by two low-standing cafés, which serve as a foreground to the Porte Royal outside. The four corners and the one street, Rue Catharine, are closed off by gilded iron grilles. Two of the grilles decorate corner fountains, the remaining three serving as gates. The Rue Stanislaus is the only one that enters the square unobstructed. The Place Vendôme, Paris, (Fig. 59) is not as successful as the Place Stanislaus, although surrounded by high palaces and containing the celebrated column. The corners of the square are chamfered and the centres of the long sides emphasized by projections.

The Amalieborg-Platz at Copenhagen (Fig. 58) is unique by virtue of the arrangement of the four civic buildings in the four corners. In the centre stands an equestrian statue, and at the main entrance, a triumphal gate. The proportions of the square are very good. It is not valuable, however, as an example for imitation, as four similarly grouped monumental buildings and two intersecting streets with but little traffic are difficult to obtain. A disadvantage with this, as well as with the Stanislaus and Vendôme squares, is that they must be crossed by the general traffic.

The dimensions of the Königsplatz at Munich are excessive, and if reduced one-third, the three buildings, the Glyptothek, the Art Building and the Propylea would appear more impressive (Fig. 55).

The City-hall Square, Vienna, is to be criticised in this respect, for although the City-hall, the University, the Parliament House and the Burg Theater are immense, they do not effectively enclose a square 200 x 400 metres. Another defect is its division by the parks and plantations which permit a comprehensive view of the whole square only from the upper stories of the surrounding buildings. By far

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more beautiful in these respects is the Lust Garten, Berlin, hardly half as large and on which the buildings appear to advantage.

The Schlossplatz at Stuttgart (Fig. 31) is remarkably fine as a garden square, but as an architectural square it is too large.

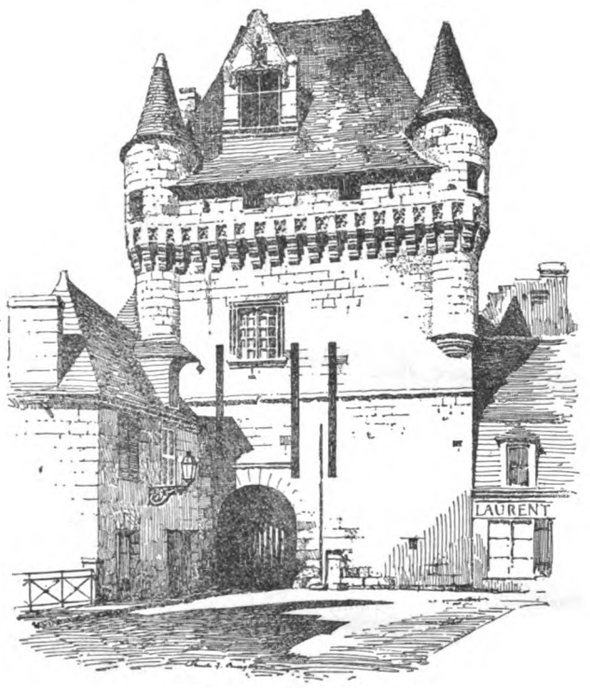
Occasionally found within palace buildings is the so-called "inside square," which may be classed between the architectural "built *around* square" and the court of the German and Italian palaces. As examples of these "inside squares" are to be mentioned the Franzensplatz in the Hofburg, Vienna, the Zwinger, Dresden (Fig. 56), the Court of the Doge's Palace, Venice, the Place du Carrousel in the Tuileries and the Palais Royal, surrounded by shops, Paris. Monotonous palace façades surrounding the public square are found in Italy, particularly as in the Piazza S. Croce and Piazza Cavour, Florence (Fig. 18), and the Piazza Vittorio Emanuele at Rome; in this respect, all the above-mentioned "inside squares" are to be criticised.

In general, the architectural square should be attempted only when monumental buildings will surround it, in which case the balance of different styles of architecture is to be preferred to uniformity.

(To be continued.)

ELECTRICAL SCIENCE FOR ARCHITECTS.[1] — II.

THE PROPORTIONING OF WIRES.



Tower at Loches, France.

A MATTER of great importance in electrical work, with regard to both safety and satisfactory service, is the correct proportioning of wires to the currents they have to carry. Conductors always offer a resistance to the passage of the current, and this not only causes heating of the wire and waste of energy, but it diminishes the pressure at the lamp, motor or other device operated.

A current of electricity, however small, will heat in some degree a wire of any size, and if the current be large and the wire small this heat may become of great intensity. The effect is not different from that in any case where resistance is overcome by force. When a nail is driven into lead it is very plain that the energy is transformed into heat. Meteors falling through the atmosphere are heated to incandescence, and even when water is forced through a pipe, a part of the energy is transformed into heat because of the resistance of friction. We may not know exactly how a current of electricity sets the molecules of a conductor into motion and thus produces heat, but we do know that it requires a certain force to make a current flow in a wire, and that if we make the wire smaller it takes more force to send the same current through it. We know, too, that if the heat generated is measured it is found to be equal to the energy expended. By making the wire smaller, the resistance is increased and more force must be applied so that this resistance may be overcome.

If a pump is to deliver 100 gallons of water per minute through a pipe, it will take a certain amount of force even if the pipe be a foot in diameter, but if it be reduced to one-tenth the size, it will take enormously more force and the additional amount will all be used simply in overcoming friction — in heating the pipe and water. In this case the heat is carried away so fast by the water itself that it is of course only the waste of power that is serious. In forcing electric-currents through wires, however, not only is energy wasted, but the heat is left in the wire to dissipate as best it can. The wire goes on heating until the generation of heat is balanced by the dissipation, and if the current is much too large the wire, in the meantime, may become of such a temperature that it will set fire to inflammable material near it. It is obviously not the total amount of heat that is generated nor simply the rate that determines the temperature. It is the rate per foot of wire. Thus while the whole of the resistance in an electric circuit is what determines the total heat generated by a given current, it is the amount of resistance per foot that, with a certain volume of current, determines the temperature to which the wire will be raised. On the other hand, since all heat generated means lost power, it is the total heat and not the temperature that affects the available force at the lamp or motor.

It is partly because of this that wires of inadequate size are so often used. The total resistance may not be sufficient to absorb an appreciable part of the force and so affect the lamps or motor, but the resistance for a given length of wire may be sufficient to cause more heat than can be dissipated by that length without great rise in temperature.

The Boards of Fire Underwriters have, accordingly, determined upon proper "carrying capacities" for the different sizes of copper wire, and wiremen generally now follow the tables provided. As inflammable material is often brought near electric-wires it has been thought wise to allow but little rise in temperature. The tables have consequently been made up with an allowable rise of about 15° Fahrenheit when the maximum current is flowing.

The following of the Underwriters' rules in this regard has done a great deal to make incandescent-lighting service satisfactory. Whatever energy is lost in heating the wire is, of course, unavailable for heating the filament in the lamp. The effect of the rules is to limit the loss or heat per foot. There might be a very small loss per foot and yet a serious total loss, but for short distances the minimum sizes of wire allowed by the Underwriters are often larger than would be absolutely necessary if consideration were given only to the effect upon the lights. In places where a small number of lights are used and where, ordinarily, guesswork would be resorted to, the rules thus do much toward securing good service.

As soon as the wiremen get away from compulsion, however, it is very likely that the wires will be too small for good results if the maximum total loss is not specified. Since every foot of wire has its definite amount of resistance depending upon its size, a definite amount of force depending upon the volume of current is spent in overcoming the resistance in each foot. The amount of force or pressure in incandescent-lighting is ordinarily kept constant, and if all the lights in a building are to burn with equal brilliancy, the loss of force in the wires must be made negligible. To this end the wire must be chosen with regard to both the distance and the number of lamps, for it is the distance that determines the total resistance and the number of lamps or "load" that determines the volume of current.

Again, the distribution of electrical energy is analogous to the distribution of water or gas. In the holiday season when the volume of gas drawn off is very great, the lights are often noticeably poor. The pipes offer so much resistance that the usual pressure at the gas-works is not sufficient to force along the great volume of gas and still give the ordinary pressure in the buildings. The same effect is seen in long lengths of water-pipe. If water is being drawn from cocks near the supply, much less will come from one farther off, although the pressure at the pump may remain the same. The pressure at the gas-jet or water-cock cannot be kept up and in the same way the electrical pressure falls before it reaches the lamp terminals, if too small wires are used. Each incandescent lamp requires its own small but definite amount of current. Turning-on the current is like turning-on water or gas, but the filament of the lamp offers so much resistance that the force at the terminals can send only a very fine stream, so to speak, through it.

The lamp itself is a good illustration of the heating effects of the current. There is a great resistance per foot in the filament. Even the small current passing through generates heat so fast that it can be dissipated at an equal rate only when the whole is incandescent. The construction of the lamp gives a conductor of considerable resistance in small space and it gives the filament "long life," but any conductor will be heated to incandescence provided sufficient current be passed through it.

A lamp is made to be used at a certain electrical pressure, and it is only at this pressure that the proper amount of current will go through it and thus cause the proper amount of light. It is for this reason that it is so important to calculate the sizes of the wires and thus give every lamp as nearly as possible the same pressure. Every branch of a line requires a separate calculation, for there are different volumes of current in each and the lamps are at different distances. It is at this point that rule-of-thumb methods fail and some degree of engineering ability becomes necessary to prevent undue loss in the wires and at the same time to prevent unnecessary expenditure for copper in the conductors. In buildings improperly wired it will frequently be noticed that lamps in one part will be much brighter than those in other parts, or it will be found that when all lamps are on, the light is poor and that it improves as some of the lamps are switched-off. In these cases it will almost invariably be found that some of the wires are too small, usually the longer ones.

There is no excuse for this sort of work except the saving it effects in the cost of material. It is not a matter of judgment nor of experience, but simply of calculation. It is known how much

[1] Continued from No. 942, page 19.

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current each lamp requires, and exactly how much the pressure will drop when the necessary current is forced over a given length of wire of a certain size. With no other force that we use can results be so easily and so exactly predicated.

Of course, with wires of reasonable size there must always be some difference in the lighting effect of any two lamps, but it is not a difficult matter to make it so small that the eye cannot detect it. It is now ordinarily specified that the electrical pressure at any two lamps in a building shall not differ by more than two per cent under any conditions of use. This difference is within reasonable limits and is sufficiently small to prevent noticeable change in lights when others are turned on or off. Russell Robb.

[To be continued.]



FIFTH ANNUAL CONVENTION OF THE ONTARIO ASSOCIATION OF ARCHITECTS. — "EVANGELINE" AND THE ACADIAN MYTH.

THE Ontario Association of Architects held its fifth annual convention in Toronto, on January 16 and 17, where at the invitation of the Hon. J. W. Ross the members met in rooms prepared for them in the School of Practical Science in the Queen's Park.

The President, Mr. David B. Dick, read an address of remarkable ability, that was voted by the members generally as the finest they had ever listened to, and at the termination of the proceedings a special vote of thanks was recorded with reference to the address. The President spoke at length on the advantages of professional associations and reviewed entire the work of the season. No effort was made during the past year, since the bill for the amendment of the Act of Incorporation was withdrawn, towards pursuing the matter, it being felt that for various reasons it was advisable to let the matter rest for a time. At the time the bill was to be brought up for amendment of the charter by the erasure of the word "registered" (often commented upon in previous letters), it happened that three distinct trades were seeking incorporation for the purpose of excluding all but particular firms from pursuing these callings, or, in other words, desired to be made "close corporations." The Press, with its usual intelligence, was inclined to class the architects with these trades, and either purposely or through gross ignorance chose to misinterpret the objects of the amendment to the Association's Act. The "temper of the House" was such that the tradesmen's bills were promptly thrown out, but the House had no opportunity of discussing the architects' bill, for the Committee on Legislation very wisely decided to withdraw it and let it stand till a more propitious occasion. The principal architectural event of the year was, of course, the "World's Fair," and the President related the history of its conception and the means employed for its execution — the meetings of the appointed architects to decide on style, proportion and grouping of the buildings and their methods of procedure towards the desired end — the results of which procured such an effect, architecturally, as the world had never before witnessed. Speaking of the training of students, Mr. Dick alluded as an example of success to Mr. R. M. Hunt of New York, who last year was the recipient of the Gold Medal of the Royal Institute of British Architects, giving an account of his professional training and studies and of his connection with the present state of architectural ability as displayed in work in the United States of to-day.

Reference was made to the work of the sister society, the Association of the Province of Quebec, and to the Mechanics' Lien Act and the amendments or other changes that have recently been made to it. The ground covered by the President in his address was very general and complete, and the excellent advice he tendered with reference to the conducting of the Association's natural programme and other matters will certainly not be thrown away.

In the discussion that followed the reading of the reports of the treasurer and registrar, which were the next items on the programme of the convention, the suggestion to form chapters of the Association in various towns in the Province, brought up last year, was again proposed. This was the means of eliciting from a member who lived in one of the towns in question an amusing account of the difficulties in the way of having local associations. He believed that in his town there was an association now, as there used to be some years ago and he did not recall any movement towards winding it up, and probably the secretary elected five years ago was still in office, as no successor had been appointed. But the then president was chosen to that office because he had, it was supposed, the largest practice — but that very fact made him the most unpopular man among them. Such was the *esprit-de-corps* in his town, that if any architect "got a job" it made every other architect so angry that it was impossible to get along as an association or chapter. He did not believe, therefore, that a chapter would be very successful in advancing the interests of the profession where he lived.

Mr. W. R. Gregg, of Toronto, read a paper on "Estimating the Cost of Buildings from Calculation of their Cubical Contents" and this closed the first afternoon's proceedings. In the evening Mr. C. H. C. Wright, Lecturer on Architecture at the School of Practical Science, gave a magic-lantern exhibition of architectural views to members of the Association and friends, which proved very interesting, even to the uninitiated of the audience. "Magic-lantern" seems hardly a sufficiently dignified name for an instrument such as that in use at the School of Practical Science: it is a magnificent instrument, one of very recent make, by the best maker in Europe, fitted with all the latest improvements and could hardly have cost less than one thousand dollars, and very probably cost more. This instrument played a considerable part in the proceedings of the Convention, as Mr. Wright had very kindly undertaken to prepare slides for the illustration of some of the papers to be read, and this greatly added to the value of the papers. The morning of the next day was occupied by reading of a short paper on "Construction of Shop-fronts during the next Decade" by Mr. Gambier-Bousfield and a discussion thereon, and a very interesting description of the "World's Fair Architecture" by Mr. W. A. Langton, the Registrar of the Association, illustrated by magic-lantern views. This paper was followed by short papers read by Messrs. Burke, Townsend, Gemmell and Gouinlock on various particulars in connection with the "Fair" from the architects' points-of-view. Lunch was served in the building, so that little time was lost from the business of the convention and the afternoon was taken up by the reading of papers.

Mr. Coleman, Lecturer on Geology at the Schools of Practical Science, exhibited specimens of the geology of the Province and gave a very interesting lecture upon them. Mr. Power, of Kingston, read a paper on "Construction," followed by one on "The Architect" by Mr. Simpson of Toronto. After which Mr. Helliwell (Toronto) read a paper on "Current Styles," illustrated by the magic-lantern. A paper on the "Scientific Insurance of Buildings," to be read by Mr. Langley, was omitted owing to the absence of the author, which was a matter of considerable regret. The convention closed with the election of members of the Council to fill the place of three retiring members. The results were not obtained without a considerable amount of voting, four ballots being found necessary.

Mr. Thomas Fuller, Government Architect, Ottawa, Mr. H. B. Gordon and Mr. J. Gemmell, of Toronto, were the successful candidates. The president for the new year was elected by the Council at their meeting on the following morning, Mr. E. Burke (Toronto) being chosen to that office.

Another charming story of history has received its death-blow by the knife of truth. We are told that "*Evangeline*," immortalized by Longfellow, has been proved beyond doubt to be fiction. The peaceful settlers are now known not to have been peaceful at all, nor were they the harmless neighbors we have hitherto believed them to be. They would never have been removed had they been so: they really made themselves thorns in the side of the English, till at last the Governor of Halifax hit upon the plan of deporting them wholesale as the simplest and least bloody way of securing peace. The Acadians were under the thumb of a priest, the Abbé Le Loutre, their spiritual guide. These primitive people were persuaded to harass the English settlers and under the disguise of Indians struck terror into the hearts of their neighbors. The Governor put them to the test by ordering them to come in and take the oath of allegiance, but Le Loutre urged them against the proposition and they refused. The colonists must be protected against them, however, and precedent for the Governor's expedient was not wanting. Dr. J. Bowman Stephenson has given us the details of the deportation, which was carried out by Lieutenant-Colonel Winslow of Massachusetts. He summoned the heads of the various families into the log church at Grand Pré, from which place they were conducted to the vessel. From the vessel the men were permitted to go in small numbers to pack up their belongings and fetch their families, and hard as the plan seems, they were well-treated and had only themselves to blame for the step. There was no scattering of families and when landed they settled down together. In after years many found their way back again and now in New Brunswick we have a large Acadian population. One Acadian is a senator, another is a judge and several others are members of the legislature of New Brunswick or Prince Edward Island. It is stated that a book is being prepared by Sheriff Richard of Winnipeg — himself an Acadian — with another version of the sad history, in which it appears that Governor Lawrence ordered the expulsion and that England had nothing to do with it, but that Lawrence had greedy eyes for their possessions, such, at least, as they could not carry away. A statue is to be erected by the wealthy Acadians to "Evangeline," as a memorial of the deportation, on the shores of the Bay of Fundy near the site of the old French village. The statue is to be heroic, an Acadian girl is to be represented bearing in her hands a medallion of the poet Longfellow, so that the memorial will have a twofold significance. The American flag is to top the whole, as it was New England that had so much to do with the event.

Electric-light for St. Paul's. — The authorities of St. Paul's Cathedral have definitely decided to introduce the electric-light, and a meeting of experts and others has been held in reference to the matter. In Easter week an appeal will be made to the citizens to defray the expense, and at the same time to find funds for the completion of the decorations. — *The Westminster Budget.*

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FIRES AT THE WORLD'S FAIR GROUNDS. — THE COURT OF HONOR AT LONDON. — THE EXHIBITIONS, LECTURES AND SCHOOLS OF THE ART INSTITUTE. — THE PALETTE CLUB'S EXHIBITION. — BRONZE LIONS FOR THE ART INSTITUTE. — THE CHICAGO MASSACRE GROUP. — THE SETTLING OF THE CHAMBER OF COMMERCE BUILDING. — THE RE-REMOVAL OF JOHN BROWN'S FORT.

ABOUT the time that our last month's letter went to print, Chicago was surprised and pained to find that flames had broken out in the Court of Honor at what had once been the World's Fair, and that what might have been the most beautiful feature to preserve in the Park, for at least a certain space of time, had been destroyed. Of course all the cities in the Union knew of it almost as soon as Chicago did herself, and every one regretted, with her, that any foreign exhibits should have been injured in the Liberal Arts Building. That this great building did not also entirely go was a marvel. It is much to be deplored that if the always-to-be-feared tramp with a match, or other viciously inclined person had to do his fell work in the building that he could not have contented himself with some of the more isolated structures, and not have attacked the one feature which of all others was most appropriate to be retained in Jackson Park. And now again, fire has broken out in the Agricultural Building and the southwest corner has been entirely destroyed before the flames could be stopped. It is purely the work of incendiaries, for tramps were seen skulking around the place previous to the breaking-out of the fire, and in fact one incipient fire was found and extinguished by a guard only a short time before the larger fire broke out. Fire, it seems, was also discovered in the Terminal Station a few days ago. There appears absolutely no reason for this incendiarism except a love of pure deviltry. The fate of the buildings seems to be still as unsettled as it was last fall, though if these fires continue there will be few buildings left to have any fate to settle. It seems, indeed, rather a hopeless problem and if fire could do more work in different directions it might not be looked upon as a catastrophe. One reason for the rapid spread of the fire through the Casino, across the Peristyle and to the Music-hall, was that in none of these constructions were any fire-stops used. In all the large buildings such precautions were taken in porticos, recesses, etc., but the urgent need of economy, and the small danger in these three structures from fire that could menace any of the exhibits induced the directors to abandon a precaution which was much more necessary in other places. It, indeed, seems as if the time had come when the Fair was to be made completely a thing of the past, as an order has been issued by the officials compelling all exhibits to be removed by February 15. The owners failing to comply with such ruling, the Exposition people will put their employés to work to remove the "remains." Foreign exhibits will go to the bonded warehouses at the south end of the grounds, while the domestic goods will be removed to down-town warehouses. As each building becomes empty it will be turned over to the Park Commissioners, and the guards on duty dropped from the pay-roll. Many feel that it is better that the Peristyle should fall as it did, rather than that it should crumble and decay, bit by bit.

Imre Kiralfy has now a scheme to reproduce, on a reduced scale, the Court of Honor in the West End of London, having been in consultation with Mr. Atwood on the subject. It is planned to show the main lagoon, the north and south canals, with the Colonnade and obelisk and the bridges, terraces and Peristyle. The façades of the Casino, Music-hall, Manufactures, Electricity, Administration, Machinery and Agriculture Buildings will be erected, while there will also be suggestions of the electrical and MacMonnies fountains and French's colossal figure. Behind the façades, the idea is to have small shops and restaurants. It is purposed to reproduce the illumination of the Court of Honor with search-lights and electric-fountains.

Following out the broad scheme of making the Art Institute really the centre of all art movements and interest, there is this month displayed there a most artistic and interesting collection of metal-work, which last summer was displayed in the German village. This display not only consists of raw metal-work itself, but iron and wood carvings, with which such work is often combined in old and curious knives, forks, spoons, etc. The whole attitude of the Institute seemed to be one of extreme liberality and breadth: To foster all artistic tastes, in whatever direction they may lead, to interest the public in all the branches of art, and to place to a certain extent an art education within its reach. Three days in the week the galleries are open to all, and the record made of the number of entrances on those days shows it to be a privilege that is appreciated. The last Sunday in January the list made a showing of twenty-six hundred admittances. It has always been the policy of the Institute to offer interesting courses of lectures to its members, but this winter in addition to these, though no notices are sent to this effect, it is generally understood that the members may have the privilege of attending any of the excellent and attractive courses of student lectures, the lecture-rooms at present offering ample accommodations for all who may care to come.

It very likely would be a surprise to even many Chicago people to know that the number of students at the Institute in all branches now approaches a thousand. Last year there were over nine hundred. This year, though the architectural department has had an increase over preceding years, the other departments are not quite so full as heretofore, owing probably to the prevalence of hard times. Should the increase next year in the architectural department be as great over this year, as this year is over the preceding ones, it would bring up this department to the rank of second largest school in the country. The Institute enjoys at present the distinction of being the only institution of its kind in the United States in which the different arts of painting, sculpture, design and architecture have each a special corps of teachers, and in fact are carried on as separate and independent departments under one general supervision, as at the École des Beaux-Arts. Astonishing as it may seem, the Institute is already becoming cramped for room. The beautiful Trocadéro casts, before spoken of in these letters, which are now the property of the Institute, have been, up to this time, housed in their last summer's home, in what was the Art Building of the World's Fair. This structure, which has now been transformed into the Columbian Museum, is now filling up so fast that the room which is used by the casts is needed. Consequently they have been turned over to the Institute and a temporary sheet-iron structure is being put up for their accommodation in the interior court of the Institute.

In connection with some of the casts from Asia Minor an amusing little incident occurred the other day. A rather curious-looking individual appeared at the office of the Director and introduced himself with the remark, "Why, you 've got a cast in there with my name on it!" Being a little surprised, Mr. French asked the man to show him the curiosity, which proved to be one of the Hittite monuments of Asia Minor. The man himself was one of our famed globe-trotters, with the usual desire to have his unknown name cut wherever it was possible to place it. He succeeded in "writing it forever" on one of the originals in far-distant Asia Minor, and consequently, when the cast was taken, the work of the name-carver being deep and clear, "Jeremiah Perkins" or "Jonathan Smith," whichever it might be, came proudly back to his native clime with the Hittite relics, there to be gratefully recognized by himself.

At present the Palette Club is holding its Twelfth Annual Exhibition on the walls of one of the galleries of the Institute. This is the club of women artists and amateurs before alluded to in these letters as having through its fourteen years of existence made itself noticeable as having combined with the minimum amount of by-laws and parliamentary ruling the least possible amount of friction, jealousies and ill feelings. This, however, is not its only claim to distinction, for if it is not already the strongest art organization in the city, it is fast taking that place. The exhibition is smaller than some in previous years and the work is generally of an unassuming character, not many large pictures being among those on the walls, but the grade of excellence is high and a good deal of strong and clever work is shown, all marked with a good deal of individual character.

Last month in speaking of the building of the Art Institute no mention was made of what, by next summer, will be a striking feature at its entrance. This will be the two colossal bronze lions which will stand at either side of the doorways. For the future of these beasts there is little to fear, for they come from the hands of Edward Kemeys. They are reported to be of heroic size, as standing in an attitude of expectancy, the neck arched, and one paw forward, as if ready to spring, the tail lashing the flank, and the whole form full of life and power. The height is nearly nine feet and from tip of tail to muzzle is eighteen. They are being cast at the American Bronze Company's works at Grand Crossing and the French superintendent of the foundry, Jules Bercham, is sparing neither time, money nor skill to make the casting as successful as possible. An amusing little fact connected with this part of the work is that the tails have been made nearly twice as thick as the bodies, for the tails of such lions, as every one knows, are a favorite perch for the terrible and omnipresent small boy, and as his habits cannot be cured, preparations are thus made to make them as harmless as possible.

It is a great gain when we really get any work in sculpture that is entirely successful. It is so lasting, so ever-present, there seems to be so little possibility of a hole being punched through a bad sculptured figure, that one feels that those who give such work to a city take upon themselves a grave responsibility, and that the selection of an artist should be made discreetly, advisedly and in the fear that the donor's name may be associated with scorn and ridicule rather than with admiration by his greatful fellow-citizens.

Apropos of this, last summer there was unveiled at Eighteenth Street the work which is known as the "Memorial Group of the Chicago Massacre." It may be ungracious to criticise a gift, and such feelings doubtless seal the mouths of many in the community, who know enough of art to see that they must either give false commendation or else keep silence, if good manners and truthfulness are to be combined. The attitude of the local press is often the same, and if they have men on their staff who could honestly criticise the work, they are kept in the background, and in the place of such criticism there are introduced interviews with the donor of the gift,

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or an enthusiastic description of the work by the artist. Such things, however, should be differently treated and a lesson ought to to be learned even at the expense of some one's feelings. This group stands on the spot where the little handful of fugitives in trying to escape from Fort Dearborn, to either Fort Wayne or Detroit before the advancing forces of the English in the War of 1812, were attacked by hostile Indians, the Pottawatomies, nearly all of the little band being slaughtered, though a certain chief, Black Partridge, friendly to the whites, performed many gallant deeds of rescue. Bas-reliefs — scenes from the life of the early settlers — surround the base of the statue, while the group itself has for its subject the rescue of Mrs. Helm (the wife of the young commander of the fort) by Black Partridge from the hands of a hostile savage. Historically, the whole work is not without interest, but artistically it is not far removed above the commonplace. The positions of the figures are strained and angular, the action is weak, the drawing far from strong and the composition not all that could be desired. One of the most pleasing features of the whole thing is the little child sitting on the ground with outstretched arms. The site of the work is exceptionally fine and it is a pity that it could not have had in it the spark of genius which distinguishes the really fine group of Indians at Lincoln Park. The Massacre Group was a present from Mr. George Pullman to the Chicago Historical Society. If the carving lately executed over the doorway of the new home of this society, now nearing completion, is anything by which the average taste of its members can be judged in matters artistic, disrespectful comments will not be made by them on the work of Mr. Carl Roll-Smith. If anything could be worse than this bas-relief over the entrance — a scene from the life of some of the early Catholic missionaries — it is to be hoped it will be executed in perishable wax, or possibly butter, rather than enduring granite, as this has been. The scene has, no doubt, some historical points of interest, but it is too bad to invite inspection prolonged enough to study them out.

One of the West Side Parks is to have an equestrian statue of Gen. Philip Sheridan, and again we hold our breath, though names like Lorado Taft and Prof. W. H. Goodyear on the committee to award the prize of six hundred dollars for the best model, make the future look less fearsome. The prize money was given to George Wagner, a Paris educated sculptor, whose model was selected from among forty others.

In art matters Chicago has a future ahead of her which is full of dangerous shoals and reefs, on which the fair fame she acquired last summer may become a sad and dismal wreck. The local Directory of the Fair, many of them with absolutely no art education, knew enough to entrust the work of general plans to two firms of men, whose ability was well known. Those men called in the best talent of the country to help them in the work that turned out such a wonderfully inspiring success. Somehow, now, Chicago has way down in her inner consciousness a settled belief that she herself blossomed out with all this wonderful artistic ability, and many are her rich men whose views are now given in matters artistic by the newspapers as being something worth reading. Already some of these rich men have indulged in little artistic flights of their own, one of the residents on the Lake Shore Drive, revelling in a little matter of wrought-iron gateway and fence, large and heavy enough to surround with dignity a forty-acre country-place, but rather overpowering the nondescript stone mansion, which is to be seen behind the bars only a few feet away. The entire wire structure is elevated on a stone wall, two or three feet high, and in places towers to the height of thirty or thirty-five feet. The design of the chief gates, upon which the owner prides himself as being partly his own conception, is rococo, Renaissance, most anything — garlands of roses, urns, cherubs' heads, Classic features, a large and pronounced letter T, all mingling in the scheme of decoration. The actual execution of the iron-work is excellent and it is pleasant to know such work can be done in Chicago; but the hopeless vulgarity of the whole thing is simply appalling.

One improvement on the North Side, which has really been an improvement, aside from being an interesting architectural gymnastic display, has been the repairs and changes made in the Holy Name Cathedral. The clerestory of this fourteenth-century Gothic church was at the time of the construction, for economical reasons, put in of either wood or iron. The roof has been held up by screws, the material of the clerestory removed, and the wood or iron replaced with stone like the rest of the church. The Gothic columns of the interior, between the nave and the side-aisles, were also for economical reasons put in of iron or wood. Screws have here been inserted, these columns have been removed and iron ones encased in marble have taken their place. The whole scheme of color of the interior decoration is a combination of browns and oak shades. The marble used for the column just mentioned is brown, while the wainscoting is of the same color and material. The roof, though not in keeping with the usual Gothic treatment, is very successful. It is of oak, rather a combination of open-timber and vault construction. The oak is kept in the natural color, which is made brilliant by the liberal introduction of gilt used directly on the wood. Some very satisfactory bronze-work is used in the gates at the chancel-rail. The design is Gothic and treated with great simplicity. Of all the Roman Catholic churches in the city, it is by far the most striking.

There has been considerable interest of late evinced in the fate of the Board of Trade tower, which, with its ship headed to the wind, has been for many years a conspicuous object on fair days. Nearly ever since the completion of the building there has been talk of its settling. It was one of the first steps taken in the developing of the system of foundations which in our clayey, spongy soil has been a great problem in the construction of our large buildings. No piles were driven on which to rest the foundations. The architect reports that they rest on a bed of concrete, prepared as for the foundations for more modern buildings, except that wooden beams are imbedded in the concrete rather than the iron I-beams of the present form. All this settlement, however, is apparently principally due to the fact that the building-committee very enormously increased the weight by ordering a change of construction and material after the building was fully under way, when it was practically impossible to do any strengthening or to increase the footings. Naturally these extenuating circumstances which should have thrown the blame, at least partly, on the Board of Directors, are never mentioned, either by them or the daily papers, but the entire blame is thrust upon the unfortunate architect. General Sooysmith has for several years been taking measurements and making estimates, and the results of those investigations are about as follows: Levels taken for five years show that the building has settled at the rate of one-sixteenth of an inch a month, the settlement amounting in the whole to eight inches, and the settlement continuing at the same rate at present. The northwest corner has settled most and is now almost entirely separate from the rest of the structure, there being a crack ten inches wide between it and the partition wall. Uneven sinking has resulted in two large cracks in the south wall running the entire length of the building. The heavy weight of the tower has caused another depression, greater still than that of the north wall. The clay substrata on which the foundations rest are full of water and very spongy. The main trading-hall measures one hundred and eighty-one by one hundred and twenty-six feet; the ceiling is very high, and the whole area of the room is unbroken. It is at present decided to strengthen the roof by placing steel trusses across the hall, ten feet below the roof-line, and that the heavy tower shall be torn down. No definite plans have as yet been made as to how the tower shall be replaced by a lighter structure, or, if the building should still continue to settle, what other measures should be resorted to. Engineers say that to underpile the structure and sink the foundations down to bed-rock would cost one hundred and fifty thousand dollars.

It may be remembered, that over a year ago note was made in these letters of an inappropriate transfer, which was to be made of John Brown's old fort from Harper's Ferry to our western metropolis. At the time it seemed a most irrational scheme, and on general principles one to be condemned most thoroughly. Subsequent events also proved that the idea was not a wise one, for, financially, it was a total failure. It is reported that the exhibition for ten days dragged on a weary existence, during that time collecting eleven paid admissions, and after an expenditure of sixty thousand dollars closed its gates. The old relic, however, was as much missed from Harper's Ferry as it was unwelcome in Chicago. Hearing of its sad fate here, a mass meeting was called in its former home, a subscription was raised for it, an option was obtained on the old building, and soon the relic will stand once more on its site overlooking the Potomac. It is to be hoped that a plain enough lesson has been taught for the future use of those who dig up by the roots and transplant venerated objects, beautiful or curious in their original place, but something to be despised with their old memories hanging at loose ends around them, or neatly salted down for transportation. An element of the ridiculous will now be connected with the old Fort, never before suggested by anything in its past history, when its fruitless journey to Chicago is mentioned.

Of interest to marine architects will be the large dry-dock to be built at South Chicago, the largest dry-dock ever built away from the Atlantic. It is expected that all will be completed to receive vessels by the first of next August. Heretofore there has been no place where repairs could be made on the big steel steamers that ply the lakes, and the ship-building company at South Chicago has often felt the want of just such a dock. It is reported that the size of the dock will be as follows: Length, four hundred and twenty-five feet, with an extension of fifty feet for the future; width at the top, one hundred feet, while at the bottom it measures eighty. The width of the gate will be seventy feet and there will be seventy feet of water over the water-sill.

THE NATIONAL SAFE DEPOSIT, LONDON.

THE National Safe Deposit Company was established with a capital of £500,000 for the express purpose of erecting, without regard to cost, a structure for safe-guarding valuable property which should be impregnable against every conceivable form of attack, either covert or open. To this end a site was chosen in the very heart of the city, within a stone's throw of the Bank of England, where the building should be isolated from all surrounding structures and, as a first measure, the ground was excavated to a depth of about 60 feet below the normal surface. During the course of this excavation, the ancient Roman pavement was come upon, and a large quantity of antique relics thrown up, a number of which now compose a part of the Guildhall Museum. After the foundation had been cut out to this depth, 20 feet of solid concrete were laid down, and on this, in turn, the outer walls were erected. These are of a

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strength and massiveness that recall those of mediæval ages. They are composed of an aggregate thickness of 6 feet of the hardest cemented bricks, which is backed by a wall of concrete two yards in diameter, forming altogether 18 feet of solid material. Within this outer wall, however, and separated from it by a narrow passage, is another wall composed of blue Staffordshire bricks. This is lined inside with armor-plate of fully 4½-inch thickness, dovetailed in sections and strengthened by wrought-iron framing. This forms the true Safe Deposit Building, situated within an outer wall, or shell, of 18 feet of brick and concrete, and within this interior, in turn, are placed the safes, or "integers," as the small safes are technically called, and the various strong-rooms.

Under the lower floor of the Safe Deposit is an enormous subterranean cistern, supplied by an adjacent well, 20 feet by 30 feet in area and 10 feet deep. Above, the roof of the Safe Deposit is formed of bomb-proof, semicircular arches, with 5 feet to 8 feet of hardest bricks and solid concrete lined with 4½-inch armor-plates and plates of iron. Over all, at the top of the external building, there is a tank, kept constantly full, containing 50,000 gallons of water. Hydrants are fixed to each floor, and each floor is isolated from the other by arches of brick and concrete. The whole Safe Deposit Building, however, might be filled with combustibles, set on fire and suffered to burn out, without occasioning any material damage. The entire building, with the safes contained in it, is totally incombustible, and the existing fire-extinguishing appliances can hardly be considered as other than superfluous. Several patents, it is stated, are represented in constructional details. The enormous supporting pillars, for instance, are cast of special fireproof composition with a metal core, and before erection were fully tested, one of them being subjected to a furnace-heat of 36 hours before being erected in its place, having suffered no material injury. The armor-plating, too, is said to be undrillable, and is of a more massive character than that of any other safe deposit in the world. The entrance doors to the vaults are 12 inches thick, of solid metal, weighing each about 4 tons. They are opened and shut in sections, and simultaneously, by a unique application of hydraulic power. And when closed each vault is hermetically sealed, fire, air and water proof. Every qualified authority who has examined the building has pronounced it to be, at all points, the strongest and most secure structure in existence.

Mr. Wilkes was good enough to conduct the writer over the Safe Deposit, which is composed of four separate floors with eight vaults on each floor, or thirty-two vaults in all. The whole premises are lit by electricity, gas being ready in reserve, and the body of the Safe Deposit is so contrived that a clear view can be obtained, from the galleries which surround one side of each of its four stories, from the ceiling of the Safe Deposit Building to its lower floor.

"The protective armor-plate casing," said Mr. Wilkes, the manager, "is stronger than that of any other Safe Deposit in the world. The one which approaches us most nearly in this respect is that of the Nassau Bank in New York, but their metal is 2 inches less in diameter than ours. When we take into consideration what can now be accomplished by the blow-pipe, it is impossible to assert that any real security can be conferred by an armor with only 1 inch or 1½ inch body. An ordinarily skilful burglar, using an apparatus that may be carried in a small hand-bag, can, within twenty-five minutes, without noise or trouble, cut a slot in an inch-plate, and make a hole big enough for a man to go through.

"The doors to the vaults are in themselves unique, and the arrangement for closing them has no parallel. The opening, as well as closing, requires the presence of four officers of the Company, holding different positions, and once closed there is no power on earth that can move them, until the proper machinery is brought into action. To drill through these doors is a practical impossibility. They are made of a metal harder even than spiegeleisen, and are the invention and patent of Mr. John Whichcord, F. S. A., the original architect to the Company. Everything relating to the working and management of the establishment is in duplicate. The steam-engine which works the lift, the electric-light and hydraulic apparatus, is in duplicate; so are the boiler, dynamos, hydraulic plant and water-supply. There is no conceivable point for which every provision has not been made."— *Invention.*

BOOKS AND PAPERS

INIGO JONES and Christopher Wren[1] are great names to the Englishman, for they represent pretty much all there was of native architectural art in Great Britain from the extinction of the Gothic and Elizabethan architecture down to the beginning of our own day. This is, to be sure, not saying much, but it is, perhaps, not surprising that since it is all that can be said the patriotic Englishman should take care that it is not forgotten.

Mr. Loftie has done his best, no doubt, to restate and confirm the claim of Jones and Wren to a place among the great masters. If he has failed, it is only because the claim is in both cases impossible to maintain. Neither Jones nor Wren was a great architect. The first fell upon a time when the art, never really at home in England, was extinct through the length and breadth of the island. He had sense enough to feel that fact, and taste enough to appreciate the quality of the work of the great Italians which he saw during his residence in Italy. But he was forty-two years old when he returned to England and was made surveyor-general, and it was only at this mature age that he began the serious practice of an art which he had until then only dabbled in as an amateur. The work which he did was respectable, marked by good taste and a just sense of the proper relation of parts to each other and to the whole design; but it was for the most part dull, formal and quite without distinction. No better instance of this can be cited than the Banquetting House, so called, at Whitehall, the one building by which he is generally known, and of which it is safe to say that in no other European capital save London would it be thought worthy of any special attention whatever. The great palace which was projected by the Stuarts, and of which the Banquetting House was a fragment, was the object of long-continued study on Jones's part, and the result of that study was the two sets of drawings made, the one for James I and the other for Charles I, which are declared by Mr. Loftie to be "the great work of his life." Judged by this standard the fame of Jones should be eclipsed by dozens of clever students in the architectural schools who are turning out every month *projets* of this sort with more invention and style than are to be found in the drawings for the palace at Whitehall. If we judge him, as we must, by the work which he executed, the result is not very much otherwise. His great houses, as Ashburnham House, Coleshill and the central block of Cobham, seem to be absolutely without merit. The façades of his city buildings, as Covent Garden and Lincoln's Inn Fields are little better, and of his few churches the only one which is dwelt upon by Mr. Loftie, St. Paul's, Covent Garden, which excited the "deepest admiration" of one British architect, which another declared to be "the most perfect piece of architecture which the art of man can produce," and which Jones himself so much admired that he desired in his will that a view of it in relief should be put on his tombstone, is neither better nor worse than a hundred wooden "meeting-houses" in a hundred New England towns, built by unpretending village-carpenters unknown to fame, in accordance with the rules laid down in Shaw's "*Carpentry for the use of the Classic Orders.*" If, as is generally supposed, Jones built the garden-front of St. John's College, at Oxford, we may regret that his way of life led him among the snares of official position when he toiled in the prison-house and served the rich and great at the rate of 8s. 4d. per day. "Slow rises worth by poverty oppressed."

What we have said of Jones may, for the most part, with equal force be said of Wren, except that, as Wren's opportunity was the greater, — such indeed as few men have ever enjoyed — so was his merit the less. This is no place for a criticism of St. Paul's, a conscientious work, not without touches of greatness, but feeble in composition and detail, and showing everywhere the lack of that easy command of great effects which so impresses one in the nobler monuments of Italy. Wren's fame rests on St. Paul's and on the minor churches which rose under his hand from the ashes of the great fire. In a few of these, notably in St. Bride's and Bow Church, the grace of the many-storied steeple redeems the poverty of the rest of the design; but the greater number are without this extenuation, and are stamped in every line and feature with that quality which must, alas, be confessed to be characteristic of Anglo-Saxon art — the commonplace — "*was hat alle bändigt, das Gemeine.*"

Mr. Loftie assures us in his preface that "this book is not written for architects nor is it by an architect." Perhaps in this view it is unfair to criticise with severity his judgments or his comparisons. Yet it is difficult to read with patience such statements as that the Italian architecture which he calls Palladian, "because the word is easy to pronounce," found in England a second home "where it flourished even better than in its birthplace," or that "in Wren's city-churches England possesses a treasure only comparable to the works of art at Florence and Rome, a treasure such as no other city could show;" or that "when convenience could be combined with architectural beauty, as in St. Stephen's, Walbrook, the result was absolute perfection." Has, then, this critic never seen the buildings of the Italian Renaissance? But photographs are abundant. Has he never held in his hand a photograph of, let us say, the two palaces by Michael Angelo which flank the square of the Capitol at Rome? Or the communal palaces at Verona and Brescia, or the Basilica at Vicenza, or any one of a dozen palaces at Florence or Venice, or the church of La Salute at Venice, or the Capella Pazzi at Florence; and then considered with a judicial and undazzled eye the Banquetting-House, or Greenwich Hospital, or St. Stephen's, Walbrook? Really one would suppose that even an English mind might be brought to feel the pathetic absurdity of such a comparison.

And surely, even a person who is not an architect and does not write for architects might be expected to avoid certain forms of speech which are calculated to make the irreverent laugh, but the judicious grieve, as where Mr. Loftie, in criticising Mr. Waterhouse's town-hall at Manchester, says the hall is forty feet high but "is so cleverly designed that it does not look seven," or where, in speaking of the staircase at Christ Church, he quotes Peshall as saying it was designed by a London architect named Smith; and

[1] "*Inigo Jones and Wren*"; or the Rise and Decline of Modern Architecture in England. By W. J. Loftie, author of a History of London. New York, MacMillan & Co., 1893.

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continues, "I can't help hazarding the guess that by Smith he must have meant Jones." Or again, when in praising the virtues of harmony and proportion, he quotes the pretty song

> "My love is like a red, red rose, that sweetly blooms in June,
> My love is like a melody that's softly played in tune."

and remarks "He might well have gone further and taken a third simile from architecture. He might have added that she resembled a Gothic spire, or a tapering marble column."

Mr. Loftie has added to his account of the two worthies who form the subject of his book, a chapter or two on the Elizabethan architecture which preceded them, and the Palladian architecture of their successors. But his liveliest chapter is the introduction which he devotes to a review of the ill-fated Gothic revival of a generation ago, for which he has no single good word. *De mortuis nil nisi bonum* is no motto for him. He pours scorn and contempt without measure on the grave of that well-meant but pathetically unsuccessful movement, and declares that it did not produce one really good or beautiful building. For the "eclectic" style which has taken its place in England he has little more respect, and objurgates Scott, Waterhouse, Collcut and their coadjutors in good set terms. We are not sure that the mantle of Sir Edmund Becket, so long a thorn in the flesh of the architects of England, has not descended upon Mr. Loftie. It is certain that they have not been treated with such contumely since that lively but not very discriminating critic subsided into silence upon assuming the dignity of a peer.

One of the most beautiful and useful architectural books[1] that we have ever seen owes its being to circumstances which, in themselves, furnish an interesting piece of professional history. A few years ago, the Society of Berlin Architects, one of the most influential professional bodies in Europe, was reorganized, and the brilliant leaders who had effected the reorganization set about concerting plans by which the Society should be enabled to gain its true place in the life of the country, as the universally accepted guide and authority in matters within its province. With this view, they undertook to select a series of subjects, which would be interesting to a large portion of the public, as well as to the profession, and discuss them in such a way as to enlist the attention and participation of persons outside the profession. This method of proceeding would, as they believed, be advantageous, not only to the public, who would profit by the information that architects could furnish on subjects of interest to both, but to the architects themselves, who, through the discussion, would be brought into more intimate relations with public opinion and feeling.

The first matter that seemed to them suitable for treatment in this way was that of the design and arrangement of Protestant Churches. In Protestant Germany, as in this country, church-building has within the last few years received a new impulse, and there is probably no professional subject which would excite the interest of more people; while in Germany the subject has an ecclesiastical importance which it does not possess here, on account of the close connection between Church and State, and the semi-official supervision which is given to the details of public worship; so that any propositions looking to modifications in the accepted practice of church-building would arouse the clergy, as well as the laity. Moreover, there is, beyond doubt, at the present time a widespread feeling that Protestant worship, particularly in Germany, while it satisfies the reasoning faculty, does not appeal, as it might, to that inner life of the spirit which takes pleasure in symbolism and association of ideas, and there is, both for architects and the clergy, a great field open for the inculcation of Protestant religious sentiment, by means analogous to those which helped to spread Christianity throughout the civilized world, and which still hold the hearts of millions of ignorant and unreasoning people firmly to the Roman Church. In studying the means by which Protestant æstheticism in church-building may be developed, as well as those by which the convenience of congregations may be better secured, it is evident that, while architects are best qualified to examine the ground, and make preliminary suggestions, they could not go far without the coöperation of the clergy; and the Berlin Society of Architects, therefore, decided that it would be desirable, first to study thoroughly the history and present condition of Protestant church-design, and then, with this complete view of the present state of the subject as an aid, to call a convention of architects, divines and friends of art, in which future improvements could be discussed.

In order that the Society might be equipped with the necessary basis of facts, it was decided to appoint a committee to collect the different types of design in Protestant churches, ancient and modern, and to Mr. K. E. O. Fritsch, the senior editor of the *Deutsche Bauzeitung*, who was an active member of the Society and of the committee, fell, subsequently, the greater part of the work of preparing the information so gathered. It soon became evident that almost nothing of value could be gained from existing books on Protestant church-architecture, most of which in Germany, as, to a less extent, in England, have been written in support of one or the other of the æsthetic and rational, or, as we should say, of High Church and Low Church, factions; and it was found necessary to appeal to German architects generally, to collect plans and information for the work. To this appeal a hearty response was given, and, although the book in which this information is presented, and which is the book before us, grew to unexpected dimensions, demanding long and continuous labor in its preparation, Mr. Fritsch modestly reminds us that the credit for it must not be given entirely to him and his Society, but that it must be considered as, in a certain measure, the work of the whole profession.

Apart from its origin and authorship, the book is a model of its kind. Containing, as it does, plans of five hundred and fifty different churches, with elevations and sections, or perspective drawings, interior and exterior, of most of them, in a volume of five hundred and sixty pages, resembling Fergusson's History more than any other familiar architectural book, the drawings are necessarily small; but they are beautifully clear and well-drawn, and lettered to perfection, while the plans have the inestimable advantage of being at a uniform scale, of one to one thousand. We would like to give an idea of the interesting way in which Mr. Fritsch traces the peculiarities of Protestant church-planning, not, as is usually done, to the requirements of an audience-room, as distinguished from a place for visible ritual service only, but to the practice, which was introduced by the Protestants, of furnishing their churches with permanent seats, allotted to the different members of the congregation; but we may find opportunity for commenting on this and other points later. Meanwhile, we need not say that the illustrations, particularly the plans, with the infinity of suggestions that they contain, are scarcely less valuable to the practising architect who does not read German than to those who do, and there is hardly a possible arrangement of auditorium, chancel, pews, galleries, pulpit, font or baptistery, or any style of exterior or interior treatment, which is not to be found among these examples, which cover, not only Germany, but Denmark, Norway, Sweden, Russia, Holland, France, Switzerland, England and the United States, and range, in time, from the Reformation, or rather, the period just preceding the Reformation, to the present day.

[1] "*Der Kirchenbau des Protestantismus, von der Reformation bis zur Gegenwart.*" 1041 Illustrations. Published by the Society of Berlin Architects, 1893, and for sale by Ernst Toeche, Berlin. Price 32 marks, ($8).

SOCIETIES

WORCESTER COUNTY SOCIETY OF CIVIL ENGINEERS.

The Worcester County Society of Civil Engineers held their annual banquet at the Commonwealth Hotel last week, Tuesday evening. President Wm. H. Coughlin presided. Speeches were made by Mayor Marsh, Architect Elbridge Boyden, Professor Kimball, of the Worcester Polytechnic Institute, Representative Eben T. Thompson, H. L. Norton of the Hawkins Bridge Company, Springfield, Architect Clemence, M. A. Boyden, Architect A. A. Barker, President Jewett of the Board of Aldermen, City Solicitor W. S. B. Hopkins and W. E. Mills. The banquet was well attended.

THE ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

ENTRANCE TO HOUSE OF DR. H. M. JERNEGAN, COMMONWEALTH AVE., BOSTON, MASS. MR. GEORGE A. AVERY, ARCHITECT, BOSTON, MASS.

[Heliochrome, issued with the International and Imperial Editions only.]

NEW LUTHERAN THEOLOGICAL SEMINARY AT GETTYSBURG, PA. MR. J. A. DEMPWOLF, ARCHITECT, YORK, PA.

This edifice now in course of erection, contiguous to the old "Seminary Building" of historic fame, will be built in local common brick and Hummelstown-stone trimmings, with Peach-bottom slate roof; including steam-heating, gymnasium, baths and other modern conveniences and appliances. The total cost will be about $40,000.

UNION CONGREGATIONAL CHURCH, NORTH BROOKFIELD, MASS. MESSRS. EARLE & FISHER, ARCHITECTS, WORCESTER, MASS.

DESIGN FOR A COUNTRY HOUSE. MESSRS. ROSSITER & WRIGHT, ARCHITECTS, NEW YORK, N. Y.

COLONIAL HOUSE, ST. LOUIS, MO. MESSRS. BARNETT, HAYNES & BARNETT, ARCHITECTS, ST. LOUIS, MO.

THE LOTOS CLUB-HOUSE, ST. LOUIS, MO. MESSRS. STEWART, McCLURE & MULLGARDT, ARCHITECTS, ST. LOUIS, MO.

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[Additional Illustrations in the International Edition.]

THE AITRE-SAINT-MACLOU, ROUEN, FRANCE.

THIS plate, which is reproduced after *L'Art*, represents a portion of the building which once enclosed the cemetery. The structure in modern times has been used for school purposes. The wooden columns are sculptured with a *danse macabre*.

TOMB AT VILLEDAIGNE, FRANCE. M. EMILE BERTRAND, ARCHITECT.

THIS plate is copied from *Architektonische Rundschau*.

MONUMENTS TO M. THIERS, AT NANCY; TO GENERAL DE CHANSY, AT LE MANS; TO RAFFET, AT PARIS AND TO THE SOLDIERS OF THE AUBE, AT TROYES, FRANCE.

THESE illustrations are copied from *La Construction Moderne*.

RENDEZ-VOUS DE CHASSE, LANGASSE, FRANCE. M. P. GION, ARCHITECT.

THIS plate is copied from *La Semaine des Constructeurs*.

SKETCH FOR A MONUMENT TO WILLIAM TELL, ALTDORF, SWITZERLAND. RICHARD KISSLING, SCULPTOR, ZURICH, SWITZERLAND.

THIS model, to which was awarded a first prize about a year ago, is reproduced after *Schweizerische Bauzeitung*.

VICTORIA TECHNICAL INSTITUTE, MADRAS, INDIA. MR. H. IRWIN, ARCHITECT.

THE Victoria Technical Institute, here copied from *Indian Engineering*, is situated within the premises and in front of the Government Central Museum, Madras.

The library is 195½ feet long and 25 feet wide, with wings running the whole length 15 feet wide. At both ends there are semicircular reading-rooms. In the wings are placed book-shelves to the height of the roof, with a gallery midway, supported on carved brackets (representing mostly Indian subjects), protected by a very handsome railing. In the whole length of the library there are six bay-windows, on either side; the upper portions of these and all other windows are fitted with stained cathedral glass in ornamental floral designs.

The roof of the central hall of the library is of Mangalore tiles with three rows of glass tiles of the same pattern, in order to throw light onto the carved cathedral-glass ceilings, the central portion of which is of planks decorated with geometrical patterns.

The roofs over the wings are terraced, with an ornamental ceiling below.

The roofs of the reading-rooms are supported by wrought-iron trusses covered over with zinc sheets, with a ceiling of galvanized-iron. Arrangements have also been made in this roof for ingress and egress of air between the ceilings and the roofs.

The walls inside are to be plastered with Madras fine plaster, relieved by panels. The cornice and pillar heads will be neatly carved and finished off. The outside walls are of brick in mortar pointed black, with terra-cotta panels over and around the doors and windows and terra-cotta pillar heads relieved by a heavy cut-stone cornice. To add to the outside appearance of the building, four turrets are constructed at the four corners, in which special staircases lead to the book-shelf gallery and to the roofs of the wings.

The tower is between the library and the lecture theatre and is 28 feet square at the base, and is to rise 175 feet above ground-level and will contain seven stories, but it is not quite decided yet if the uppermost two stories will be the same as that shown in the accompanying elevation.

The lecture-theatre is semicircular with a radius of 74 feet. The class-rooms are two stories high.

THE GLASGOW ATHENÆUM. MESSRS. J. BURNET, SON, & CAMPBELL, ARCHITECTS, GLASGOW, SCOTLAND.

THE illustration, from a drawing which was hung in the Royal Academy Exhibition of this year, shows the front to Buchanan Street of the new portion of the Glasgow Athenæum, which, as indicated in the plan, is an addition to a block previously built, and with which it is connected by a bridge on one of the upper floors. The back portion of the new block consists to some extent of old premises, which were acquired and then rearranged and refitted internally.

The front of the new portion towards Buchanan Street, which forms the main architectural interest of the building, is treated in a very bold and original manner, both in main composition and in detail, especially in regard to the tower-like portion which marks and emphasizes the position of the staircase.

The concert-hall and theatre is intended partly for performances by the students of the school of music connected with the Athenæum (which we gather is an educational establishment and not a club in the ordinary sense). It holds about a thousand persons, and, like the rest of the building, is lighted by electricity. On the floor above is a billiard-room and class-rooms.

The system of heating and ventilation forms a special feature in the internal arrangements. The air, before being introduced into the building, is passed through a filtering-screen and purified from all dust particles, fog, or other extraneous matter. It is then passed through steam-heated coils of piping, where it is raised to the required temperature, relieved from all superfluous moisture, and passed on to rotary fans, by which it is propelled into ducts or channels leading to the several apartments of the building, and discharged through ornamental gratings, so placed as to secure an equal distribution throughout the apartment. The areas of the inlet gratings have been so determined that the current of air may be reduced to a velocity which is almost imperceptible, while the gratings are fitted with regulating louvres, by which the currents may be diverted in any direction found to be most comfortable to the occupants of the apartment. While the primary object of the steam-heated coils of piping is to raise the temperature of a cold external atmosphere, provision has been made so that the same coils of piping may be utilized for the circulation of cold water in order to reduce the temperature of a warm or sultry external atmosphere when necessary. Two distinct plants of machinery and main ducts have been put down, one being specially reserved for the requirements of the concert-hall. Flues for the extraction of vitiated air are placed in the most effective positions. In the concert-hall provision has been made for the introduction, by the aid of one fan only, of a volume of purified fresh-heated air equivalent to 1,200 cubic feet of air for each person per hour, or otherwise equal to a volume of air 15.80 times the cubical contents of the hall per hour.

Entrance to the hall can be gained, not only from Buchanan Street, but from the St. George's-place portion of the Athenæum, where there is crush-room and cloak-room accommodation; there are also cloak-rooms and lavatories adjoining the area and gallery entrances to the hall. The platform is so arranged that it can be adapted either for concert or theatrical purposes.

This print is copied from *The Builder*.

PUBLIC BUILDINGS, FARNWORTH, ENG. MESSRS. BRADSHAW & CASS, ARCHITECTS.

FARNWORTH is a growing and prosperous manufacturing town, one of the many Lancashire centres which are rapidly increasing in size and importance. The site of the proposed public buildings occupies one end of a large space used as an open market-place, and it fronts the highway between Bolton and Manchester. The design emphasizes the main façade, and is governed by a three-fold purpose — to provide public offices and hall, to arrange a dignified entrance to the market-ground, and erect buildings for a new post-office. The walls have red-brick facings, with a liberal amount of light, warm-toned terra-cotta and stonework, the roofs being red tiled. On the first floor is the public hall, with suites of rooms adjoining; it has a fine wagon-headed roof, and ample window-spaces. The drawing was exhibited at the Royal Academy this year and is here copied from *Building News*.

WEST FRONT OF PETTON HALL, NEAR BASCHURCH, SHROPSHIRE, ENG. MR. THOMAS BOWER. ARCHITECT, NAUTWICH, ENG.

SOUTHEAST FRONT OF THE SAME.

INTERIOR OF MORNING AND DRAWING ROOMS OF THE SAME.

INTERIOR OF THE HALL OF THE SAME.

NOTES AND CLIPPINGS

A COLOSSAL CHIMNEY AND ELECTRIC-RAILWAY PLANT IN BROOKLYN. — The chimney-shaft of the Brooklyn City Railroad Company is said by the engineers to be the largest chimney in cubic-capacity yet built, the inner core or flue-area having 65,800 cubic feet of air-space. It is 293 feet high, the sides of the base measure 38 feet 3 inches, and taper-in to a height of 85 feet, where the circular form is assumed. The structure rests upon a foundation of 14 feet of stone and 9 feet of concrete, supported by 1,201 piles, and contains over 2,000,000 bricks, with a total weight of about 3,000 tons. The iron cap surmounting this big stack weighs about five tons and is 27 feet in diameter. Up to the middle of the flue rises a "baffle-plate" of fire-brick to a height of 60 feet. This is to give each of the two flues a separate draught. The chimney is designed to carry away the smoke and gases from thirty-six 500-horse-power boilers using forced draught. Under natural draught the stack would have required an additional 70 feet in height to accomplish the same result. The inner case, or chimney proper, is entirely distinct from the outer wall, and is 282 feet high, with walls 24 inches thick at the base, tapering to 8 inches at the top and 17 feet in diameter. This is in order to allow for the expansion due to the enormous volume of hot air which it is designed to carry off. The outside wall is built with twelve buttresses projecting inward, and reaching to within half an inch of the core. Lateral expansion being thus provided-for, the perpendicular gain, which is reckoned at one-sixteenth of an inch to a foot, is provided-for by building from the outward wall inward, above the top of the core, a curved apron, or "toothing" of brick, leaving an aperture 17 feet across, or just the

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diameter of the core. The new power-house was designed by F. S. Pearson, of Boston. To celebrate the completion of the chimney, a dinner, to which about sixty guests were invited, has been given in its interior. The first of the six big multipolar dynamos requires two Corliss engines to keep it running, and steadiness of motion is secured by a fly-wheel 25 feet in diameter and weighing 90 tons. These dynamos are said to be the largest railway power-generators ever built. — *Invention.*

Caliche Cement. — Caliche, the name given by the old Spanish settlers of Arizona to a sort of half-rock, half-clay material, proves on analysis to be a valuable geological formation, and bids fair to enter the commercial arena ere long as a new cement. The caliche lies upon the surface, or very near it It is often found from 6 feet to 25 feet in thickness, and covers many thousand acres of surface. Whenever found it was until recently considered a decided detriment — it interfered with the cultivation of the soil, was useless for grazing purposes, and produced no precious metal. In these three items were found almost the limit of Arizona's supposed resources. But not long since, samples of this peculiar, "worthless," clayey rock were sent to competent chemists for analysis, with the result that this much-abused caliche was declared by them to contain the proper constituents in the proportions to make the very best Portland cement. In fact, the analysis indicated the same constituents in almost the same proportion as in the best English Portland cement. Some of the samples contained about twenty per cent of sand, but it is claimed that much of the material contains no sand and also that the sand can be readily eliminated. Should the claims, as at present made, prove practically true, the discovery is one of large importance, as the use of Portland cement is constantly and rapidly increasing and forms a large item in our imports. And if the caliche, which is so plentiful and is easily and cheaply obtained, will furnish a product approximately equal to English Portland cement, it will prove a mine of wealth to Arizona, to the owners of the caliche beds, and to all interested in new construction in the line of buildings, bridges, aqueducts, or dams and street improvements. It would soon result in cheapening the article and also — an item of no less importance — diminish our imports of it from foreign countries, adding that much to the country's independence and the nation's wealth. — *Waverly Magazine.*

Sir Edward Burne-Jones. — The official recognition of the merit of Mr. Burne-Jones's art, involved in the bestowal upon him of a baronetcy, will come as an agreeable surprise upon the extremely wide circle of his friends and admirers. All the same there will remain a sense of incongruity in the acceptance of a hereditary distinction by one whose note hitherto has been that of detachment from the applause of the world, or, at all events, from the approval of his contemporaries. Mr. Burne-Jones found even the yoke of the Royal Academy too heavy to be borne, and withdrew a year or two ago from the ranks of its associates, which he should never have entered. If the honor, however, be congenial to him and his family, there is no more to be said beyond a word of congratulation that British art is thus honored in the person of one of its foremost representatives. Sir Edward Burne-Jones paints in a curious old house between Kensington and Hammersmith, formerly the residence of Samuel Richardson, the novelist. His son, Mr. Philip Burne-Jones has made some mark as a painter, though not in the same direction as his distinguished father. — *Edmund Yates in the New York Tribune.*

Golden Images Unearthed from the Ruins of Tlaxiaco. — A discovery of great scientific interest has been made in excavations being carried on in the district of Tlaxiaco, State of Oaxaca. A number of small images, formed in metal, were uncovered by the workmen in one of the oldest ruins a few days ago. The images represent people of Oriental appearance and dress, as well as priests in their robes of sacrifice. They bear hieroglyphics of unknown characters and are elaborately wrought, with fine art lines shown in every curve. The images found thus far are of gold, either wholly or in part, and are coated with some unknown enamel, which has preserved them from all harm in the many years they have been buried in the soil. They will probably be shipped to the National Museum in the City of Mexico, where they will be placed at the disposal of the scientific world for further study and discussion. The find is the most important of the year in the domain of antiquities, and preparations are now being made to conduct a complete exploration of the Tlaxiaco ruins for further evidence of the ancient civilization which is known to have flourished in Southern Mexico. — *N. Y. Times.*

Washington treed by a Lion. — Whoever has seen the Washington Monument in Baltimore, with the crouching bronze lion of Barye near its base, will appreciate the story they tell about the rustic huntsman on his first visit to town. He was shown all the objects of interest in Baltimore, one by one, but gave each only a passing glance and not even so much as a word of comment. When he came in sight of the Washington Monument, however, a new light shot from his eye. At last it was obvious that something had been found to interest him. He scanned the shaft for some minutes, running his eye from the base to the point on which the statue stood and back again, then fastened his gaze on the crouching lion as if fascinated. His lips parted, and his city friends drew near to hear his criticisms of the sculptor's art. At last, out came the words: "He's got the old man treed, ain't he?" — *Kate Field's Washington.*

Why Street rebuilt Crewe. — When Crewe Hall was burned down, some years ago, Lord Crewe exhibited coolness equal to that displayed on a similar occasion by Sheridan. He ordered a table to be placed on the lawn, and, calling for ink and a telegraph-form, wrote the following message to Mr. Street, R. A.: "Dear Street: Crewe is burning. Come and build it up again." In accordance with his instructions, the minutest details of the hall, a fine old Elizabethan structure, were carefully reproduced. — *N. Y. Tribune.*

Glass Floor in Dynamo Room. — The Continental Insurance Co. is erecting a new building at 44, 46 and 48 Cedar Street, New York, and has contracted to have the floor in the dynamo and engine-room made of 3-4 inch deck glass. This arrangement, of course, insulates the men working about the dynamos and gives a flooring that it is very easy to keep clean. It is likely that this scheme, which was suggested by the president of the company, is one that will be generally adopted.

Town Ownership of Rich Clay Beds. — The theories of certain social reformers are to be seen in actual working in the little community of Klingenberg-on-the-Main, in Germany. In the neighborhood of this town are valuable pits of fire-proof clay, which the authorities in days gone by were far-sighted enough to retain as public property, instead of allowing them to be owned by individuals. They are worked by the municipality for the public benefit. The result is that Klingenberg is one of the happiest places in Europe. Not only do the profits on the clay suffice to cover all local and imperial taxation, but there is a considerable surplus, the bulk of which is divided among the inhabitants. In addition, a present of 15 marks is made this year to every young man who is beginning his military service. — *London Daily News.*

Determining the Age of a Tree. — "I have been called upon in court frequently to pass upon the age of a tree, in order to decide as to the date of a land survey," said Dr. J. T. Rothrock, the State Forester, the other day. "I cannot say that the rings of a tree are a certain indication of its age, although the common belief is that a tree makes a ring every year. I remember a very important case in New Jersey where a great deal depended on determining the exact year of a survey. Our side based its case upon the fact that a section of a tree that had been chipped at the time of the survey showed it had afterwards grown a certain number of rings. To show the fallacy of such an argument, I produced a section of another tree chipped during the same survey which, when cut in half, had more rings upon one side than upon the other. I asked why one-half should be taken any more than the other to determine the age of the tree. It had either only made a half-ring or a ring and a half some one year. Trees may make no rings some years while in others they may make two. I have known of cases in the tropics where they have made three or four rings annually." — *Pittsburgh Despatch.*

The Deserted Capital of Alabama. — Years ago, when our grandfathers were babies, the capital of Alabama was the beautiful little city of St. Stephens. It was the first capital of the State, and each year there assembled there the men who started the ship of State on her journey. But not alone did these old worthies go there to make laws. Like the statemen of this day and time, they mixed considerable frolic with their labors. Most of them were rich and lived in opulence in their lovely country homes. When they went to the capital, therefore, they proceeded to get out of town life all there was in it. In consequence, old St. Stephens was a fast and godless place. The biggest gamblers in the State collected there and fleeced the rich and unsophisticated planters and lawmakers. It is related that it was an unwritten law that no preacher should invade the precincts of St. Stephens. One day a Baptist minister reached there and proposed to preach. He was unceremoniously seized, put in a skiff and rowed across the river, where he was left with the injunction that if he returned he would be tarred and feathered. Tradition says the good man uplifted his hands in honest indignation and prohesied the decay and ultimate abandonment of St. Stephens. His prophecy was fulfilled, for nothing now remains of old St. Stephens except some rock foundations and some memories. Fifty years ago the town was abandoned, the capital was moved to Tuscaloosa, the centre of the State, and the present St. Stephens, the seat of Washington County, was built upon the river. A visit to the site of the first capital of Alabama is full of interest. As you approach it you discover the ruins of once handsome dwellings. The stone foundations show that they were massive and indicate that they were built with no regard for economy. Coming to the town proper, one can easily trace the streets and thoroughfares. They were carefully surveyed and laid off, and many of them were paved with stone. Near the centre of the old capital city are found the remains of the old State Bank and those of the leading hotels. About all that remains of the former institution is the stone vault, in which was kept the money of the State and of the rich legislators. The cellar is about all that remains of the principal hostlery, and from the bottom of this massive oaks are now growing. The cellar is laid in solid stone masonry, but some fifty years ago acorns, buried beneath the floor, shot little sprigs up between the blocks of stone, and, as the twigs grew and strengthened into trees, the rocks were pushed aside to let them spread. Probably the place of most interest, however, is the foundation of the first Capitol. That it was a handsome building for those times is evident from the masonry of the foundation. The building was small, not, if the foundation is not misleading, exceeding forty-five feet square. Just in front of it is one of the grandest old oaks in the world, under whose shade did our old great-grandfathers most probably sit, discuss affairs of State, swap negroes and play poker. The boundaries of old St. Stephens would indicate a city of some 6,000 people, but the population was never more than half that large. One of the most interesting things about the ruins of old St. Stephens is the cemetery. Probably not a spade nor hoe nor rake has touched its soil for more than half a century, and yet the choicest flowers and vines and trees grow there in rank profusion. Cape myrtle, ivy and evergreen, honey-suckle, grapevine and wild rose mix up and embrace each other as no florist on earth could make them do. Handsome marble shafts shoot high up in the air, but each is covered with a matting of ivy. The names on the shafts are unknown to this generation, although many men of history are buried there in unmarked graves. — *St. Stephens' Atlanta Constitution.*

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"RECITATION HALL"

LUTHERAN THEOLOGICAL SEMINARY

GETTYSBURG, PENN'A.

J. A. DEMPWOLF, ARCH'T.

YORK, PENN'A.

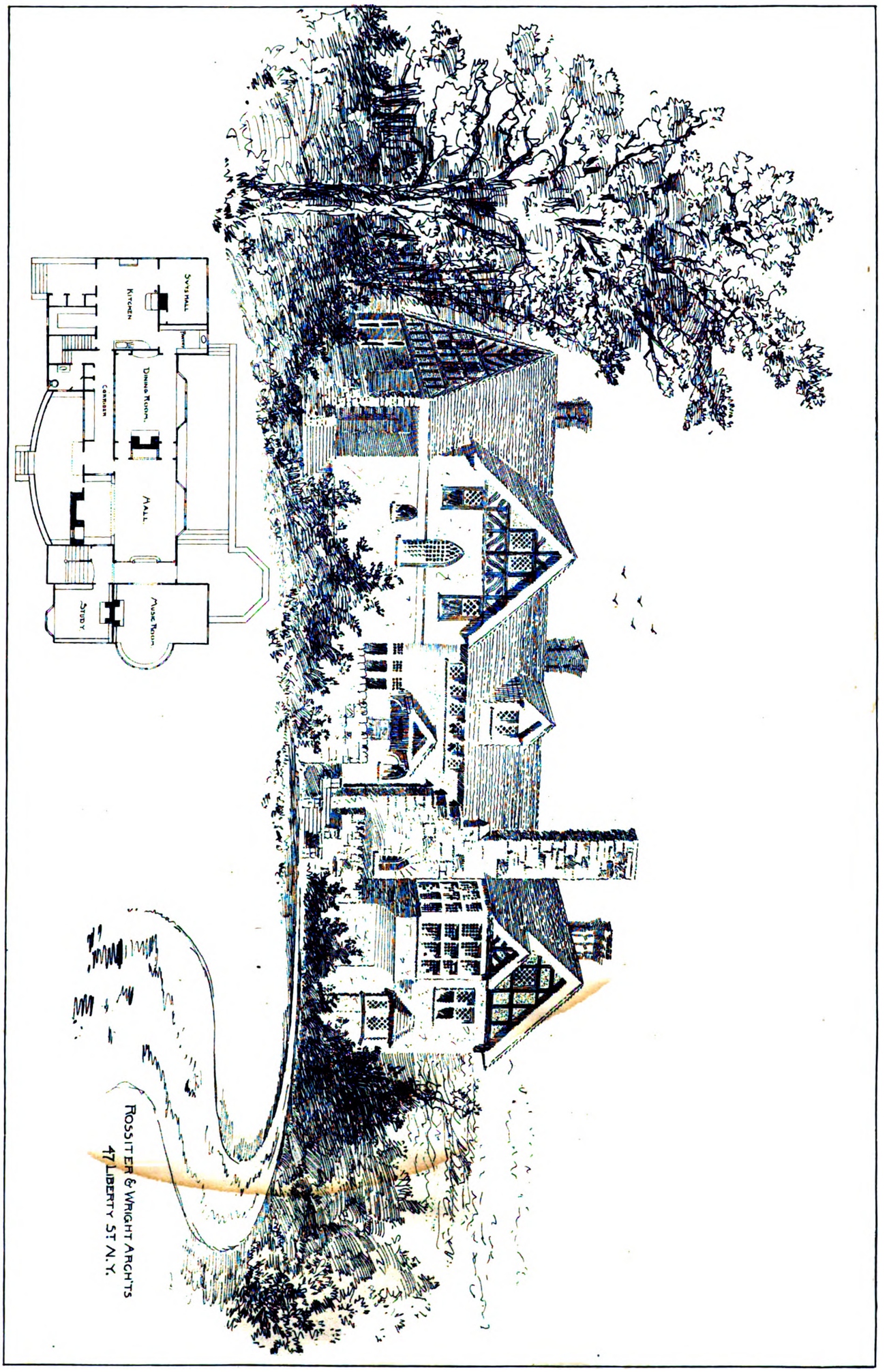
VIEW FROM THE NORTH WEST.

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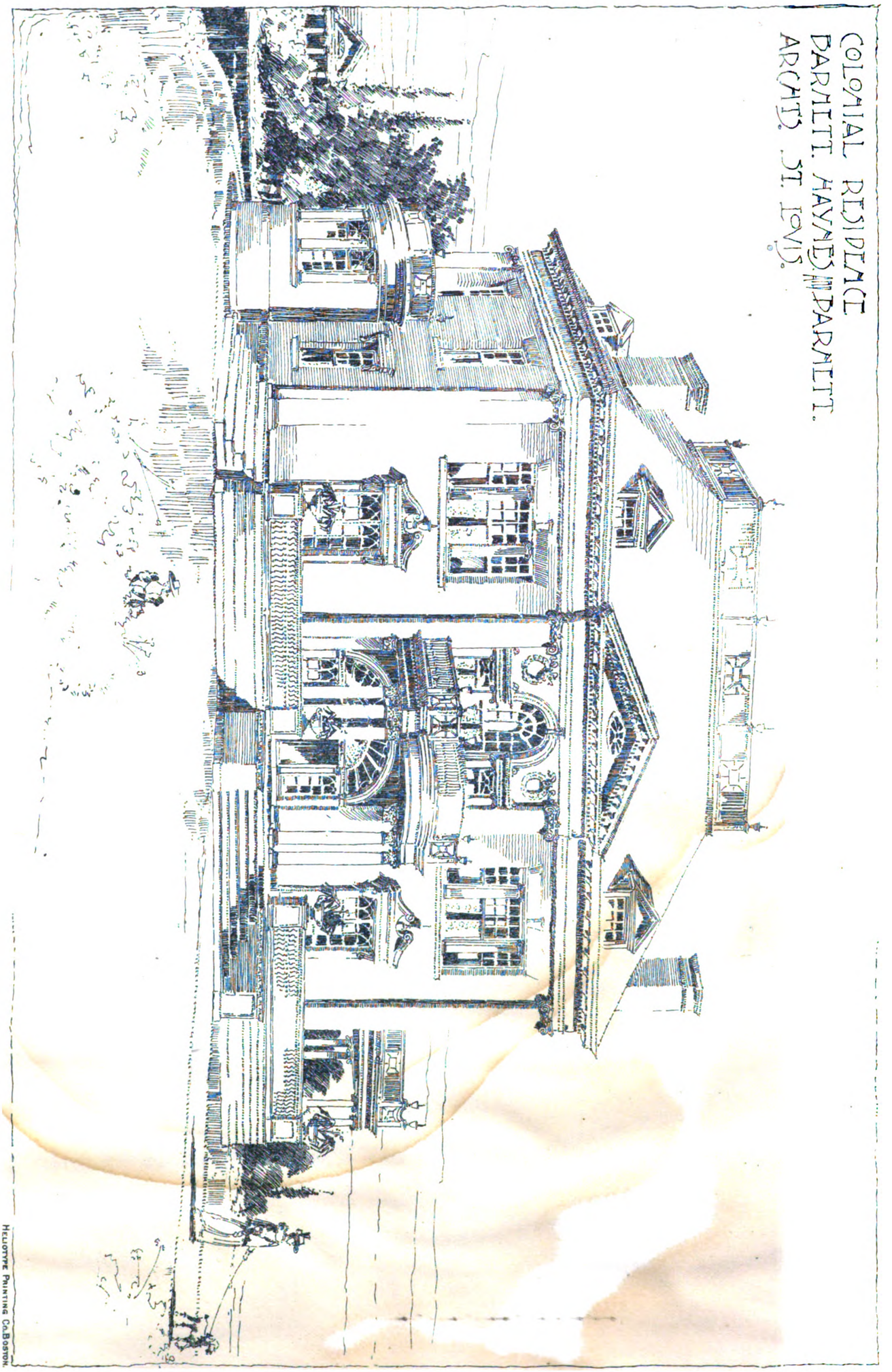
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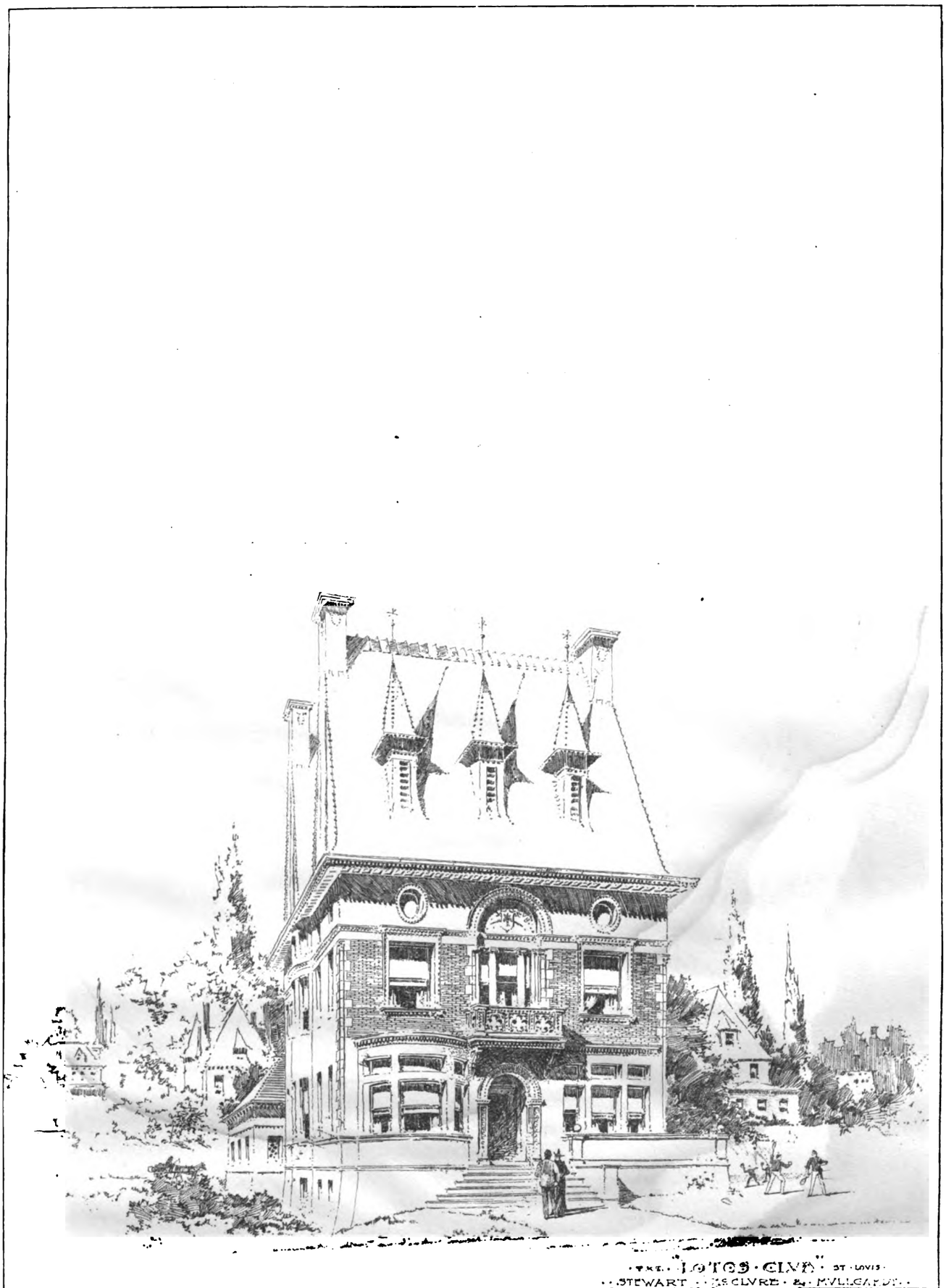


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WE note that the New York *Evening Post* somewhat bitingly recommends us to consult "some elementary work of reference" because we credited to a work of Michael Angelo's the remark that was really applied to a painting by Correggio. Perhaps casual anecdotes are "elements of art criticism"— to some people. The *Evening Post* administers its gentle castigation because of our remarks on the nude in public places, and because of this we will say that our position may be reduced simply to this: the absence of nudity is never shocking to anybody, while its presence in public places is a shock to a great many worthy people, many of whom know quite as much about art as those who defend the misuse of the undraped figure. These objectors, who doubtless pay as much into the public purse as do those who seek to outrage their feelings, and have at least an equal right to influence the use of public money for public purposes, hold morally the better position, since they are the offended party, and it was in their behalf that we insisted that their side of the matter should be fairly presented, since the partisans of "journalism" as the *Evening Post* is fond of styling it, seemed to devote their energies to coming as close as they could to immoral suggestiveness in deriding their opponents.

AN engineer writes to the *Engineering Record*, to "protest," as he says, against the requirement usually included in architects' specifications for steam or hot-water heating, that "the building shall be heated to a temperature of seventy degrees in zero weather." He thinks that this, which, as he says, is the "standard requirement," often causes "bitter experience" to the contractor for heating. This "bitter experience" is, fortunately, in the cases which he mentions, nothing worse than having to wait for their money until it pleases the thermometer to drop to zero, so as to show whether the agreement is performed; but, as in Philadelphia, the place from which he writes, the thermometer did not fall so low for eleven years, previous to the winter of 1892–3, it may be imagined that contractors, in that city, at least, are sometimes put to considerable inconvenience. The *Record* correspondent thinks that heating contractors ought to refuse to sign contracts containing such condition, but thinks that a satisfactory clause might be substituted, to the effect that the heating system should be "capable of maintaining a temperature of seventy degrees on a basis of zero weather," and that no reputable heating contractor would refuse to sign this.

THE trouble about the substitute is that it substitutes some one's judgment for evident facts. If the thermometer outside stands at zero, and inside at seventy degrees, there can be no further controversy as to what the heating apparatus will do; but to decide, with the outside temperature at perhaps twenty degrees, whether the warming would be satisfactory in colder weather, is a very different matter. A good architect, or an expert engineer, by studying the boiler, the piping and the radiating surface, could infer what the probable result would be, but owners want facts, not inferences, and, even if one of them were willing to leave the acceptance of the apparatus to the architect's judgment, the latter, to make sure that the owner's requirements would be fulfilled, would probably allow a margin for contingencies, in the way of radiating surface and boiler capacity, which the contractor would object to. For cold climates, therefore, where there is no lack of zero weather every winter for trying the apparatus, we still think that the ordinary test is the fairest and best for both parties. It protects the owner, who, if his rooms are sure to be at seventy degrees in such weather, knows that his most important requirement is met; and it protects also the ingenious and scientific engineer, who, if he can obtain this result in an economical way, by skilful piping, and effective application of radiating surface, is not obliged to convince a sceptical architect of the value of his arrangement before he can get his pay. Where zero weather is of rare occurrence, and the owner wishes for a tangible fact as a guarantee, it might perhaps be possible to require that the building should be warmed to seventy degrees, with the outside temperature at, say ten degrees, and a boiler pressure, or back pressure, in the case of heating by exhaust steam, of not more than a given amount, and that the system should also be tested to a much higher pressure to make sure of its capacity for withstanding it if necessary.

A HABIT which has grown up among heating contractors, and is, we are sorry to observe, spreading to other kinds of contractors, is to insist on furnishing their own specifications. Probably the laziness or incapacity of architects has something to do with this practice, but if an architect is fit to be entrusted with important work, he knows how to write heating specifications, and if he knows enough to write such specifications, he probably has some definite notions as to how he wishes the steam or hot-water to circulate, what sort of boiler he thinks best to use, and where it will be most convenient for the pipes to run; to say nothing of the preferences that he is likely to have for certain sorts of valves, particularly of air-valves; but the chances are now that, if he writes a specification covering these points, and submits it for estimates, he will not, in return, receive a single proposal based on it, but will, instead, be furnished with an assortment of printed specifications, touching lightly, if at all, on some points which seem to him of great importance, and, in regard to others, mentioning, instead of the appliances that he wants, others, of which he knows nothing, except that the contractor furnishing the specification is interested in the patents on them. If he says that he would rather base the contract on his own specification than the printed form, which is evidently prepared with skill to promote the interests of the party who offers it, he is probably told that it is an immutable law of the bidder's establishment that no contract shall be signed except on the printed form, and, in the end, he submits, perhaps, with a good deal of persuasion, procuring the insertion of a saving clause, that the work shall be done to his satisfaction. Even with this addition, however, troubles often arise in the execution of the contract, from the feeling of the contractor and his men that they are doing the work on their own terms, without being subject to any one's dictation or interference, and the architect has hard work to secure that respect of such contractors for the rights of others which is essential to the successful completion of a building in which several contractors are engaged, and which, in his own specifications, he had carefully provided for. It would be too much to say that architects ought to refuse to consider any bids not based on their own specifications, but it is certainly very advisable for them to insist upon the addition of such provisions as they think necessary for securing the coöperation of the different contractors, and their submission to the architect's authority, to the printed forms, before they advise their clients to sign them. If any bidder should refuse to agree to these additions, his proposal ought not, in the interest of the owner, to be considered at all.

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EVERY one who takes any pleasure in literature, to say nothing of the beautiful English domestic architecture of the Elizabethan period, will be interested to learn that the mansion and property of Charlecote, comprising about five thousand acres of land, are to be sold by the Lucy family, in whose possession they have remained since Robert Shallow, Esquire, justice of the peace and Custalorum, boasted there of his three hundred years of gentle ancestry. As is well known, the present mansion was built by Sir Thomas Lucy, the original of Shakespeare's "Justice Shallow," just before Shakespeare's birth. Queen Elizabeth was entertained in the house in 1572, when it was probably just finished, and it has remained practically unchanged since. There is hardly in England, and, if not in England, certainly nowhere else in the world, a private estate with which so many memories are associated. Justice Shallow, according to Shakespeare, underrated the antiquity of his family. It is not six hundred, but eight hundred years since Walter de Cherlecote, who was known as the patron and founder of the monastic establishment of Thelesford, near Charlecote, assumed the name of Lucy, which he transmitted, with his great estates, to the descendants who still hold them. Outside of the royal families, there are very few people in Europe who can trace their descent in an unbroken line to the twelfth century, and fewer still who live on the spot which their ancestors have occupied for eight centuries, so that, even without their connection with Shakespeare, the exile of the Lucy family from Charlecote would excite interest and sympathy.

A CURIOUS tomb has been found at Alexandria, dating from the early Christian period, but belonging to the sect of the Gnostics, or rather, to that small division of the Gnostic heretics known, from their reverence for the serpent emblem, as Ophites. The Ophites, like many other people who pride themselves on their superior spirituality, were very lax in their observance of the rules of morality applicable to more ordinary persons, and they frequently attracted, in consequence, the unfavorable attention of the secular authorities. For this reason, probably, the Alexandrian Ophites, like the Roman Christians before them, were accustomed to hold their devotional meeting in subterranean galleries, which served also as places of burial, and it is one of these galleries, rather than a tomb, which has been discovered, in what is now the Park Antoniadis. The opening of the gallery is in the face of a rocky ledge, and is well concealed by the bushes with which the rock is now, and probably always has been, overgrown. From the entrance, a flight of forty-six steps leads downward to a room, about twenty feet square, into which open five other rooms. The large room was evidently intended as a place of meeting, and a well still exists in it, sunk in the floor near the foot of the staircase. Whether the well was intended to furnish water simply for the refreshment of the congregation, or for baptism, which was a ceremony of great importance among certain of the Gnostic sects, does not appear, but it was probably for the latter purpose. The smaller rooms, although only open doorways, or even rows of piers separate them from the central hall, were devoted to sepulture, the walls being pierced with deep *loculi*, in which a coffin could be thrust endwise. There is a great difference in richness of decoration between the various sepulchral chambers, and it is possible that they were the private property of individuals or families. One, however, the richest of all, seems to have been devoted to the priests, or rather teachers, of the congregation, for it contains, in the middle of the most conspicuous wall, a representation, in high relief, of an immense serpent. In this wall, grouped around the serpent, are three *loculi*, one below the figure, and one at each side, which seems to have belonged to the highest ecclesiastical officials of the community. Apart from the serpent sculpture, the room is decorated with a dentilled cornice, and antæ at the angles, while a representation of an altar, with engaged columns and mouldings, formed a frame for the serpent, and pilasters and engaged columns, with a sort of pediment, and rows of round shields, ornament other portions of the enclosure. Three of the other rooms show pilasters and moulded cornices, but are otherwise plain, and the walls are filled with *loculi*, one room having thirty, and another twenty-seven. Traces are, however, found of painted inscriptions and decorations, in bright colors, on the walls around the openings of the *loculi*. The fifth room, situated at the foot of the staircase, close to the wall, is decorated with pilasters, and a dentilled cornice. There are no *loculi* in the walls, but a stone bench runs around three sides. The proximity of this room to the well, with what is known of the Gnostic ceremonies, seems to indicate that it was a waiting-room for the neophytes, who were obliged to remain there, as in a sort of narthex, until baptism with the water of the well had prepared them to participate in the sacred ceremonies. What these ceremonies were, we can only infer from the exaggerated accounts of the orthodox enemies of the sect. According to them, the principal service was a sort of mass, in which bread was placed on the altar, and the congregation, surrounding it, sang a series of hymns, ending with a prolonged *diminuendo*. As the voices died away, leaving the participants in a state of exalted anticipation, a rustling was heard and a monstrous serpent, trained for the purpose, glided out of the darkness, climbed the steps of the altar, and coiled himself around the bread. This formed the consecration of the sacrament, and the worshippers, after prostrating themselves before the reptile symbol of the Good Spirit, took the bread and divided it among themselves, singing hymns to the glory of the Eternal. It may be imagined that the atmosphere of a subterranean temple of this sort would be none of the most wholesome, and, in order to give some sort of ventilation, holes were pierced at intervals in the vaulted ceilings of the rooms, which were carried to the surface. The ceiling of the main room has fallen in, but the traces of these shafts are visible on the fragments, and the ventilators in some of the smaller rooms are still intact. *L'Architecture*, from which we borrow the account, written by M. Hippolyte Boussac, of this most interesting discovery, says that the place is constantly wet, by infiltration from the Mahmoudieh Canal, which passes near, and the stonework is rapidly decaying.

M. ANDRÉOLI, in the *Revue Industrielle*, describes a simple method of obtaining chlorine and caustic soda, by electrolysis from common salt, which is not only interesting as a piece of industrial chemistry, but is of great value to paper-makers, who consume immense quantities of caustic soda and bleaching powders, and could, by this process, make them for themselves, on their own premises, for half the money that they have to pay for them in the market. M. Andréoli gives a photographic view of his little electrolytic plant, which consists of a slate tank, with a slate cover, divided by partitions of porous porcelain, made with asbestos, and slowly baked at a high temperature,—1,500° Centigrade. This substance is not attacked either by caustic soda, or nascent chlorine, and, while very porous, so that it has little electrical resistance, it prevents entirely the diffusion of the soda and chlorine between the positive and negative compartments. The anodes are of retort-carbon, set in the slate cover of the tank, so that nothing but the carbon is exposed to the chlorine vapors, the metallic connections, which would otherwise soon be destroyed, being above the cover. The cathodes are of metal. In order to reduce the electrical resistance as much as possible, the pairs of anodes and cathodes are set close to the porous partitions. In this way, with a pressure in the tank of less than four volts, decomposition of the salt water contained in the tank goes on very rapidly. Glazed earthenware pipes are set in the slate cover, so as to receive the chlorine gas from the positive compartments, and an ebonite pump forces it into wooden casks, where it is automatically shaken up with milk of lime. The chlorinated liquid from the positive compartments, by another pump, is made to circulate through a series of pipes, and return again to the tanks, simply to keep it cool; and the alkaline liquid from the negative compartments circulates in the same way through an iron reservoir, returning again to the electrolytic tank. As the separation of the chlorine went on, the liquid would soon be exhausted, and decomposition of the water would begin, if the supply of salt were not renewed, and this is done very simply by means of a cylinder, standing in the liquid, and containing salt, which gradually dissolves, and keeps the solution saturated. Of course, as the chlorine is disengaged from the positive compartments, the liquid in the negative compartments becomes richer in soda, and it is finally drawn off, and the soda solution concentrated for use, while the process is recommenced with fresh solution. The power to drive the dynamo and pumps is small, and M. Andréoli estimates that, with coal at twenty francs a metric ton, and counting in the cost of salt and lime, the expense of concentrating the soda solution, and of labor, the cost of his chloride of lime and alkali is less than half the market price.

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THE FRENCH RENAISSANCE.[1] — III.

LET us glance first at the characteristics common to the two above-mentioned periods, that is at the essential characteristics of the Renaissance itself. The most prominent, and until recently, the most misunderstood of these is nationalness. Our architects of the sixteenth century were never for a moment plagiarists, nor for a moment did they allow the action of the Italian architects to be substituted for their own.

The Renaissance, from the reign of François I, rapidly severed its material connections with the Gothic; but, though the letter was effaced, the spirit still lingered, the spirit that had animated the Pointed style and, previous to that, the Romanesque, the spirit that had presided at the transition from the one to the other.

Therefore, in the sixteenth century we sometimes find not only tastes and preferences belonging to the Pointed period perpetuated, as has been sufficiently shown for the transitional period of the reign of Louis XII, but also, what is much stranger, unquestionable survivals of the Romanesque art. The logic which, in the eleventh and twelfth centuries, had forced Greco-Roman architecture to submit to compromises, naturally led now to compromises and, consequently, to analogous forms. Surely, we must not seek in any sentiment whatever of archæological imitation for these but slightly marked coincidences: these colonettes in the splays, these covings with trail and various other decorations, these Corinthian capitals handsomely chiselled or loaded down with fantastic motives, these bases with claws, these gemel-windows, which, in the cloister of Fontevrault or in that of Saint-Sauveur de Melun, for example, in the bell-towers built in Anjou by Jean de Lespine, in certain portals of the Burgundian school with semicircular arches, force one to an effort to convince himself that he is not looking at a monument of the time of Louis le Gros.

But this is only one of the piquant sides of the French Renaissance; in its ensemble it could not be converted into a sort of revised, corrected, and finished edition of Romanesque art. Although in France, Renaissance art, like the Romanesque, was an intermediary period between antique and Pointed art, the transition was accomplished this time in an opposite direction and the positions of the two styles with reference to each other, under the last Valois, was not what it had been under the first ten Capetian princes. Architects had matured with the experience of four centuries, they had been practised in the Pointed style, the training of the hand was no longer a thing to be accomplished, and they found themselves, with regard to ancient art, in a systematically conciliatory attitude. They were no longer, as in the twelfth century, in despair at the thought of bending Classic traditions to the necessities of an uncompromising liturgy; they disturbed themselves little about that; the concessions that seemed to be requisite for bringing about this happy and fruitful union, which seemed possible and even easy, were to be made in the field of civil architecture, which was then in the ascendency and which had less to do with technical difficulties. Far from appearing as an enemy and an obstacle, ancient art was looked upon as a valuable auxiliary which only needed to be subjected to a humanizing and disciplining process; the prestige of youth, which it owed to its long sleep and to the successes of Italian architects, soon converted it from an auxiliary and associate, into a master; but, when this transformation was effected, the Renaissance had ended.

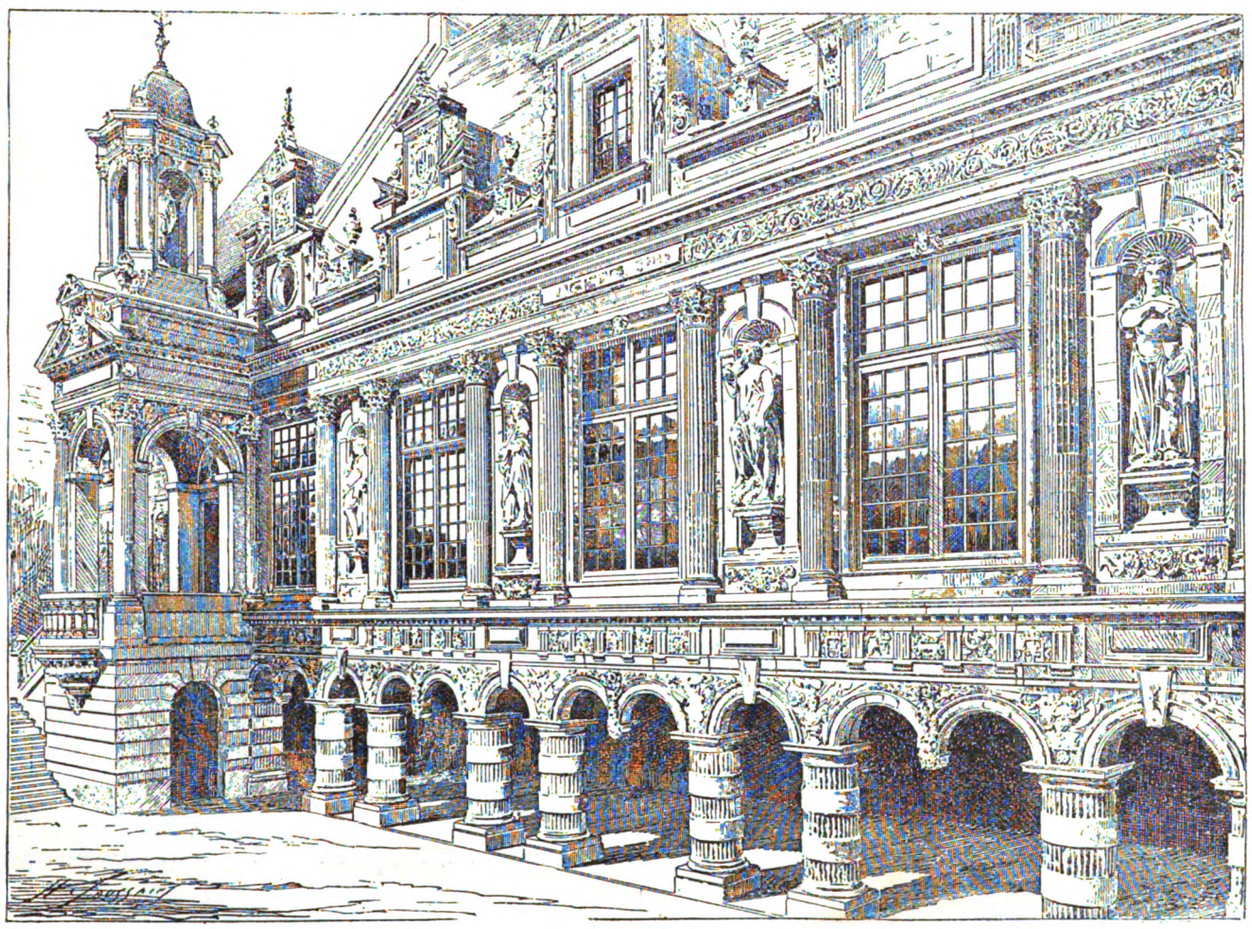


Fig. 6. Hôtel de Ville at La Rochelle.

The French spirit had contracted in the practice of Gothic art a disdain, almost a disgust, for symmetry; though in a softened form, this same disdain appears again during the Renaissance. The Classic module, profiles and ornaments, were adopted; the semicircular arch supplanted the broken arch, which was confined to a few vaults or church windows, and also the flat arch, which nevertheless did not disappear altogether but took on new features. This Classic order did not, however, extend above the first story and as it did not have the supremacy in the general disposition, whenever the slightest conflict occurred with the programmes, it was obliged to compromise, yield and distribute itself irregularly, except in the case of a few edifices that were conceived with an exceptional

[1] From the French of Anthyme Saint-Paul, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 946, page 64.

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effort toward the "grand style." Bullant, that he might have an opportunity to introduce at Écouen, in all its majesty, the column of the temple of Jupiter Stator, drawn by him at Rome, made use of the colossal order (Fig. 5); but this combination is almost unique and is seen in full vigor only

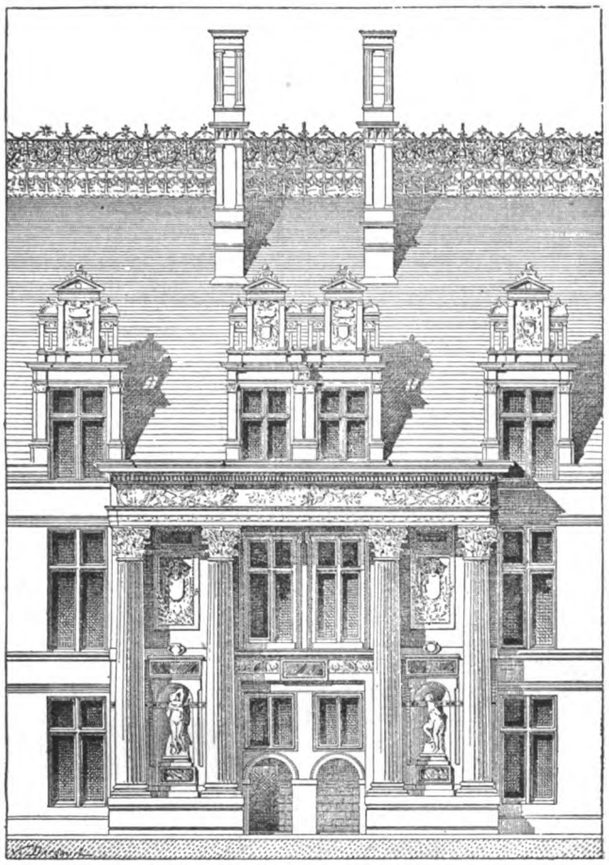


Fig. 5. Door of the Château of Ecouen.

under Louis XIV. Strangely enough, in compensation for this, at the very moment when Bullant took this premature step toward modern art, his *confrère*, Philibert Delorme, was composing a "French order"; owing to the difficulty of quarrying and transporting monolithic shafts, for the sake of economy, it became necessary sometimes to resort to the use



Fig. 7. Fireplace in the Hôtel du Vieux-Raisin, Toulouse.

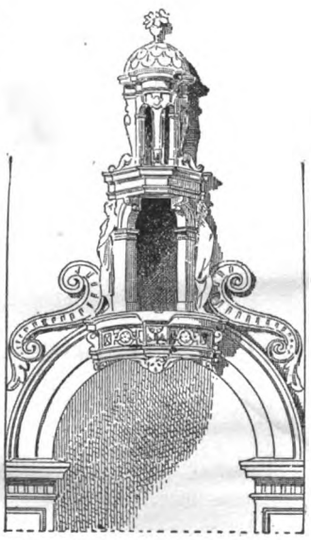


Fig. 8. Dais at Saint-Maclou, Pontoise.

of tambours; Delorme considered it illogical to seek to conceal these; he thought it was better, on the contrary, to accuse them sharply by alternations in the diameters, or by the ornamentation, a process which was later extended to the courses of the pilasters and walls. (Fig. 6.)

From the handling of Pointed architecture came also a tendency to verticality — a tendency of which the persistent steepness of the roof is not the sole reminder. The doors with the windows, and the windows themselves, are grouped in a way to add to the appearance of height rather than breadth, forming, especially in the pavilions, towers and turrets, elaborate decorations which are still further elongated by being made to correspond to rich dormer-windows. Special thought is, likewise, from habit, given to the crownings, particularly when they stand out directly against the sky; their lines had to be varied harmoniously; and the balustrades, pinnacles, dormer-windows, crests and finials were treated in this respect with scrupulous care. Through an exaggeration of brutal logic, which might be set down as a protest against Italian methods of treatment, if its germs were not to be detected in the dwellings of the Middle Ages, the external chimneys were abnormally developed, thus admitting of wonderful varieties of composition and ornamentation and raising these minor members to the rank of principal elements. While in Italy, with the exception of the huge domes, the cornice is the terminal feature; in France, it merely indicates an edge of an edifice, and sometimes it serves as a base, or point of departure, as well as a finishing. At Chambord, the zone of the roofs was so captivating to the architect that the rest of the castle gives one the impression of having been



Fig. 9. Well at Kerjean (Finistère).



Fig. 11. Trail and Arabesque Patterns.

built for it. Lastly, the binary disposition, so out of harmony with Greco-Roman ideas, which admit of neither pier, nor column, nor *piedroit* in the axis of a structure, was maintained down to the complete triumph, under Louis XIV, of academic ideas.

Between these principles on the one hand, and, on the other, the great pediment and the great dome, which enjoyed such wide-spread popularity in Italy, our architects of the sixteenth century thought to discern signs of incompatibility; toward these two important elements they assumed an attitude of distrustful reserve, which was not overcome until some time during the seventeenth century. They utilized the pediment and dome only for details, reducing greatly their dimensions and minifying their rôles. The antique pediment itself was out of the question, owing to the slope of the roofs, for no one had yet thought of introducing an obtuse pediment in front of a steep roof; it figures only at a comparatively late date in dormer-windows very near the sky; but above windows and doors, and, strange to say, over fireplaces even (Fig. 7), framed with columns, pilasters and arches, or under cornices, the disposition was promptly enough tolerated, and tolerance very soon became fashion.

Bell-towers were capped by a cupola, which did not, however, occupy the entire breadth, if this seemed at all excessive.

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The upper story was sometimes narrowed by means of a truncated cupola, and the terminal dome rested on a circular or polygonal drum. The towers of the Cathedral of Tours realized the perfection of the style. In turrets, buttress projections, pinnacles, canopies (Fig. 8), fountains or wells (Fig. 9), loggia-like watch-towers (Fig. 10), and altar-screens, where small dimensions were rigorously necessary and where the cupola no longer formed a constructional element, it was lavishly introduced and almost always in the happiest fashion.

In view of this powerful, rational and earnest personality, did our architects need the stimulus of assiduous and constant competition on the part of foreigners? We are forced to acknowledge that there would have been no French Renaissance, or, at least, that Renaissance would have been wholly unlike what it was, if there had been no Italian Renaissance; it is also true that Italian architects visited France, that they made themselves very useful there and that French architects were compelled in their course of training to study Italian productions; but the initial impulse once received, these artists were very soon perfectly capable of choosing their own course and following it without continual guidance; more than this, they even carried their masters along with them. In the

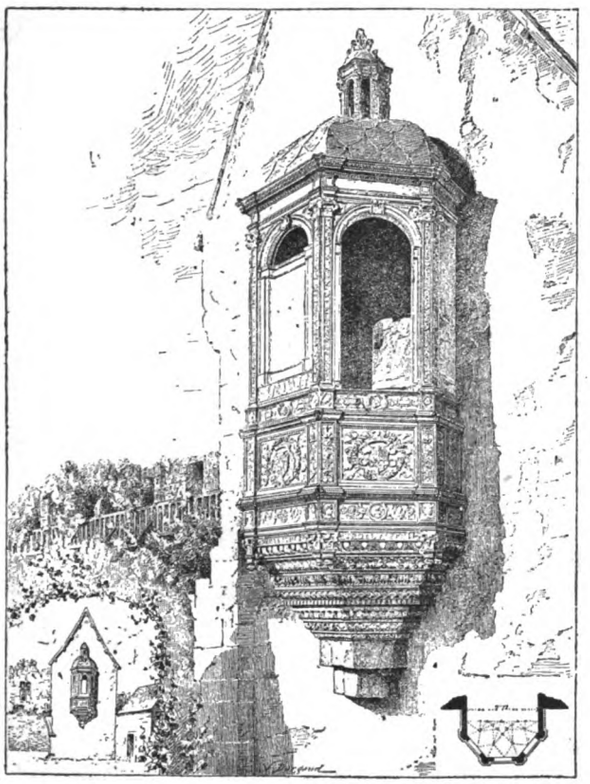


Fig. 10. Loggia of the Château de Vitré.

latter part of the reign of Charles VIII, and early in Louis XII's, Italy transmitted directly to France many details which had not yet been rejected by the Florentine, Venetian and Milanese Schools and which had great success with us: arabesque and trail ornamentations (Fig. 11), pilasters with lozenge decorations, colonnettes of varying entasis, figure medallions, shells and small pediments with openwork finish; but, later on in the sixteenth century, when the Roman School of San Gallo, Bramante and Michael Angelo had been established, what could Italy have bestowed upon France except that Classic art, which, in fact, did not gain free admittance here until a hundred years later?

France indeed possesses a few purely Italian works of the sixteenth-century style at its height; for example, the doorway of the Hôtel de Ferrare at Fontainebleau, designed by Serlio, and two singular edifices, a manor and a sepulchral chapel, built in Brittany in imitation of the Cancelleria at Rome, by a prelate desirous of perpetuating the memory of some high functions which he had discharged in the Eternal City; but these constructions are so out of harmony with everything around them that one is at once convinced that the exception proves the rule.

We may also note that of all the Italian architects who came to France, none ranked among the first at home — San Gallo passed through Provence merely to get some sketches of ancient monuments —, none had sufficient prestige or influence to force his views, his methods, or his plans upon this country. Nothing can convince one of this more conclusively than an impartial examination of the importance of the rôle played by the Palace of Fontainebleau — a rôle too readily exaggerated. The artistic movement of which this royal residence became the theatre in the sixteenth century was doubtless a considerable, even an exceptional, one; but it came a quarter of a century too late to alter in any notable fashion the course of French sculpture and architecture; at the very most, it seriously affected only the destinies of painting. And, above all, notwithstanding the share which foreign masters seem to have had in the movement, it remained in its general lines preëminently national.

[To be continued.]

PUBLIC SQUARES.[1] — IV.

MONUMENT SQUARES.

WHEN the monument constitutes the principal object, the square becomes a "monument square." We have already seen, in many of the



Fig. 60. Piazza Carlo Emanuele, Turin, Italy.



Fig. 61. Piazza Savoia, Turin, Italy.

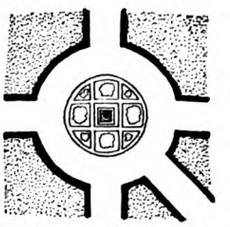


Fig. 62. Karolinenplatz, Munich, Bavaria.

examples cited, monuments suitably placed on traffic, garden, market and architectural squares; but some of these are not adapted for monuments while others adapt themselves particularly well.

It is not permissable to place a monument in the centre of one or more lines of view, without considering whether the traffic and the line of sight are disturbed thereby and whether the street stands in correct relation to it. Figures 60 and 61 are not suitable for monument sites on account of the inconvenience imposed on the traffic. In this respect, however, the Obelisk of Munich (Fig. 62) is better placed, while the Thiers Monument, at Nancy (Fig. 63), disturbs the traffic but little.

The positions of the monuments in Figures 14 and 64 are very effective, the passage around the monument in Figure 64 being only for pedestrians. In the place where stands the monument to Buodognatus at Antwerp, the traffic from the Avenue Charlotte to the Rue des Nerviens is certainly much hindered by the garden, and the same hindrance is felt in Figure 65, but not at all in Figure 66. In all the last-mentioned examples the effectiveness of the monument is undoubtedly heightened by plantations. A most prominent monument square is the Piazza dello Statuto at Turin (Fig. 67), surrounded by monumental buildings with colonnades. At one end in the axis of the Via di Dora Grossa stands the high and effective rock pyramid, enlivened by fountains and marble figures, and crowned with an allegorical angel figure commemorating the completion of the Mt. Cenis Tunnel.

The Place de la Concorde, Paris (Fig. 57), in size and arrangement is the richest monument square in Europe. It is enclosed by a monumental stone breastwork, the eight corners of which contain colossal figures representing eight French cities in a manner guarding the entrances, which are also emphasized by magnificent

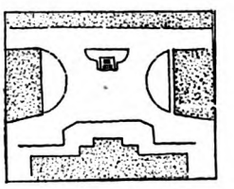


Fig. 63. Square Thiers, Nancy, France.

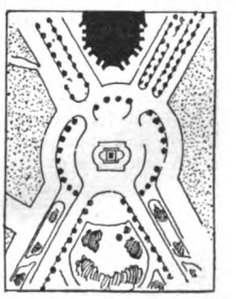


Fig. 64. Loos Monument, Antwerp, Belgium.

candelabra. In the centre stands the celebrated Obelisk of Luxor and on either side in the longer axis, two beautiful several-storied fountains. From the centre through four magnificent streets a view is obtained of the Madeleine, the Palais de la Chambre des Députés, the Louvre and the Arc de Triomphe de l'Étoile, each of which forms the terminal point of the the line of sight. The effectiveness

[1] A graduating thesis by T. M. Newton of the Architectural Department of Columbia College, New York. Continued from No 946, page 67.

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of the square would be heightened if the surroundings on the Seine side were of a more enclosing character. The Place is 390 yards in length by 235 yards in width and is bounded on the south by the Seine, on the west by the Champs-Elysées, on the north by the Rue de Rivoli and on the east by the Garden of the Tuileries.

Trafalgar Square, London (Fig. 68), has the advantage of being better enclosed and, although of small size (within the breast walls

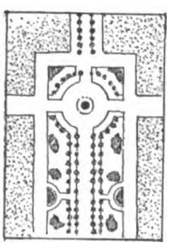


Fig. 65. The Maximilian Monument, Munich, Bavaria.

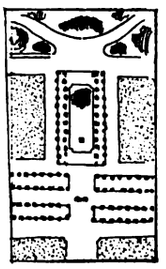


Fig. 66. The Leys Statue, Antwerp, Belgium.

100m. x 100m.), it is very impressive. The very high Nelson Column, the statues of Napier and Havelock, and the two fountain bowls constitute the decoration and, by contrast, diminish in effectiveness the equestrian statue of Charles the First at Charing Cross, which is directly in front. Both the Place de la Concorde and Trafalgar Square, as they have no garden decoration, serve admirably for public festivities.

Double, or Twin, Squares. — In the laying-out of a city and in city-enlargement, the designer, after carefully considering the requirements, often finds it necessary to create an open square serving several purposes at once, as a market and architectural, or monument and garden square. As the traffic square least of all adapts itself to other purposes, it frequently becomes necessary to place a second square along side of it, which gives rise to the double square.

A twin arrangement of unusually large dimensions and great effectiveness is shown in Figure 14. The streets lead up from the Via di Porta Venezia, with a slope of 1:20, to the traffic square directly in front of the railway-station.

Equally good is Figure 69, the Piazza Acquaverde at Genoa, the lower half of which is used for the traffic while the upper half, covered with beautiful plantations and enclosed by the ascending streets from the Via Balbi, makes a suitable site for the monument to Christopher Columbus.

The Piazza Grande, at Trieste (Fig. 70), shows a combination frequently made of a garden with an architectural square. The open place is the fore-square to the city-hall and is decorated with fountains and monumental candelabra.

The combination of the traffic square with the architectural fore-square is exemplified in Figure 71: the church of St. Vincent de Paul rises on the decorated garden terrace beyond the Place de Lafayette and forms the terminal point of the Rue d'Hauteville. The gentle concave ascent of this street adds much to the already effective position of the church.

THE ARTISTIC CONSIDERATION OF THE PUBLIC SQUARE.

The most important relation of the public square to the city is its artistic relation. The shape and decoration of the square are, therefore of the greatest importance in giving a pleasing aspect to the city, which, once built up, is exceedingly difficult and expensive to alter and rearrange.

We will now discuss the enclosure, the arrangement of the buildings, the size, the position of monumental buildings, the grouping of squares, and the furnishing and subdivision of the square.

(*a*) *The Enclosure.* — It is the architectural frame that makes the free and open place a square. A mere line on the

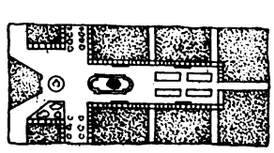


Fig. 67. Piazza dello Statuto, Turin, Italy.

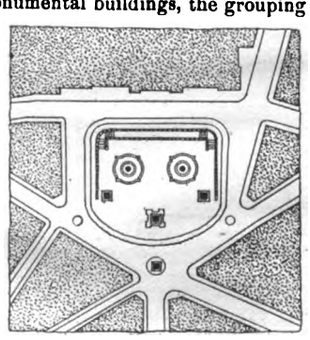


Fig. 68. Trafalgar Square, London, England.

plan, or an enclosing wall or plantation is not sufficient. Street-crossings and enlargements are not, artistically speaking, city squares and even the traffic square, which on account of its purpose is open on many sides, only exceptionally possesses the character of the architectural square when the intersections of the traffic streets with it are concealed or subordinated by an arcade or colonnade carried over the mouths of the streets.

The traffic squares, shown in Figure 20 by the enclosing railway-station wall on the one long side, Figure 21 by the gate and buildings on one side and the ramps on two of the other sides, Figure 18, and particularly Figure 19 by the arcades surrounding the open space, show in part the necessary characteristics of the architectural square. In general, the traffic square, open on many sides and crossed by wagons and pedestrians, is somewhat disturbing and unrestful, and artistically unsatisfactory.

It is evident that the enclosure cannot be complete, as streets of approach are necessary, but their entrances, as already shown in Figures 19, 21, 29 and 69, can be partially hidden and so arranged that the enclosure is cut up as little as possible.

The colonnade either supports the façade, is built out from it as a portico, or is an independent structure as at St. Peter's, Rome. In all three cases it serves as a covered walk and gives to the square a decorative frame.

The wrought-iron grilles of the Stanislas Place in Nancy (Fig. 11), the breastwork balustrade of the Place de la Concorde (Fig. 57), and the breastworks on the short sides and the terraces on the upper long sides of Trafalgar Square, London (Fig. 68), are peculiar kinds of enclosing framework. As a substitute for closing the mouth of the street, such an arrangement may be adopted that the opening will appear of little importance, so that the spectator on entering the square sees in front of him an enclosing architectural wall and not a distant perspective through the continuation of the street. In many old cities these considerations were regarded and the streets were made to enter the square in the direction of the openings of a turbine wheel, as in Cologne, Stralsund, Düren, Brunswick, Ravenna (Fig. 72), and Mantua (Fig. 73). Two streets should not enter a square directly at their intersection, as they would make too large an opening in the frame. It is, therefore, desirable, if the conditions of traffic permit, to have them intersect well out of the square, letting but one enter.

(*b*) *The Symmetrical and Picturesque Arrangement of Buildings.* — The buildings surrounding a square require a certain harmony in composition which is obtained in many instances by similarity or a symmetrical arrangement, as in the Place Vendôme, the Piazza of St.

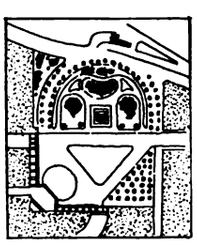


Fig. 69. Piazza Acquaverde, Genoa, Italy.

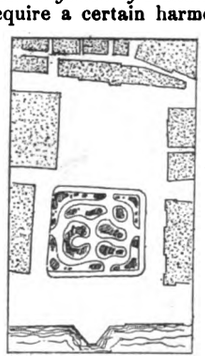


Fig. 70. Piazza Grande, Trieste, Austria.

Mark's, the Campidoglio and others; but it is obtained as well by a picturesque arrangement of buildings of different kinds so often seen in the Market Places of the Middle Ages, as at Lübeck, Bremen, Stralsund, Breslau, Cracow, Brussels, Vienne and others. Generally, in these squares, the city-hall, a court building or a church constitutes the main picture in the framework, and other buildings such as jails, guard-houses, inns, etc., are picturesquely grouped around it.

Two main buildings can be placed on opposite sides of the square without difficulty, as the eye is not confused by seeing both at once; but it is questionable to place two such buildings together on the same side, even if they are symmetrically disposed with respect to the axis of the square. This arrangement which gives to the buildings a coupled appearance is often employed in modern cities, but the necessity of two similar and equally important buildings does not often occur; when it does, however, the coupled arrangement should not be forced by the city plan. In spite of the changed conditions of business and traffic, the carefully-studied and artistic surroundings of a square are indispensable if we wish to raise the standard of our cities to the high level of those of antiquity or of the Renaissance.

(*c*) *Shape and Size.* — If the city square is to have an enclosed effect, its plan must be such that the entire composition has unity.

Enclosing lines that are too much cut up, as in Figure 4, with many corner projections, destroy the effect of unity. Concave lines should be striven for and the convex avoided in the plan.

This does not require that the building-lines shall conform to a curve, but that the designer should arrange the buildings on somewhat the same principle that the photographer employs when he places the individuals of the group with an artistic freedom in a generally concave line, giving to a few only of the more distinguished a prominent position.

The effectiveness of such squares as the Leipzigerplatz, Berlin, the Place Vendôme, Paris, the oval fore-square of St. Peter's, Rome, and others, depends largely on these considerations. Indeed many traffic squares, intersected by streets on all sides, are successful by virtue of their concave building-lines.

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The public square does not require a strict geometrical shape, nor any strict symmetry, but an æsthetic balance is necessary. The accentuation of misshapen forms should be avoided. The mediæval squares, apparently arbitrary in shape, but in reality the growth of centuries, must not be imitated in spite of their great beauty; for, however well they satisfied the requirements of their period, they would not those of to-day, and that much of their beauty due to the picturesque effects of time would be lacking in a modern reproduction. But, in spite of the difference between modern and mediæval times, we learn from the irregularity of the old squares that we can make ourselves independent of conscientious regularity and symmetry in the details when the entire composition is to be adapted to our own times.

From this it follows that we need not be hampered by a straight-edge and compasses, although these are the instruments which we must make use of.

The Piazza Erbe, at Verona, is very pleasing, although the two sides are not symmetrical, nor are the details regularly disposed. By such irregularities, projections and recessions, squares like the three-cornered, not in themselves beautiful, may be made endurable and even picturesque, whereas, in the strictly symmetrical triangular square so usual in modern cities, the building-lines join each other harshly.

The Size. — The size of the square should be regulated by the purposes for which it is intended and by the size of the buildings to be erected upon or around it. The valuable work by H. Maertens "*Der Optische Mass-stab, etc.,*" and the comparative study of known squares furnish data from which the size of a square can be artistically regulated. Maertens gives the four following rules:

1. A distance equal to the height of the building, giving an angle of sight to the top of 45°, is particularly suitable for viewing the details.

2. A distance of twice the height, giving an angle of sight of 27°, can be considered as normal for viewing the building as a whole.

3. A distance of three times the height, giving an angle of sight

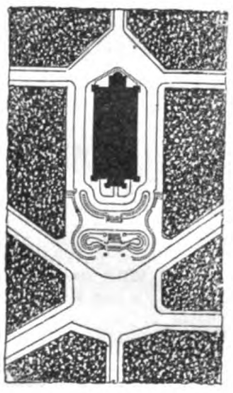


Fig. 71. Place de Lafayette and the Fore-square of St. Vincent de Paul, Paris, France.

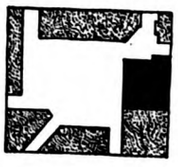


Fig. 72. Piazza del Duomo, Ravenna, Italy.

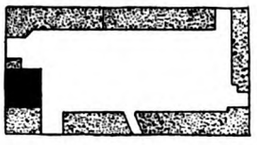


Fig. 73. Piazza San Pietro, Mantua, Italy.

of about 18°, obliterates the detail and combines the building and its surroundings in a composition.

4. A distance of four or five times the height furnishes merely a picturesque ensemble, in which the building is effective only by means of its outline.

Towers and the like and unusually high roofs should be included in the height of a building. The greatest angle of elevation that still permits a distinct view of the building is about 70°.

According to the above rules, the width of a street or square on which a building is to be erected should be, at least, equal to the height of the structure. Most city regulations permit a height greater than the width of the street; on the other hand, a too great width of street is undesirable.

Hence, it follows that the greater number of mediæval squares are too small and many modern squares excessively large.

From these rules of Maertens's, we conclude that the square which is more than twice or three times the height is unfavorable to the effectiveness of the building. This, however, does not exclude a dimension even as great as four times the height in order to view the building in connection with its surroundings, for such a square is as permissible as the street on which the building forms the terminal point of view. But even in the streets the proportions must be considered, for, if the distance be increased to more than six times the height, the importance of the structure in appearance is much diminished, unless an immediate comparison with smaller buildings is possible. Maertens's rules hold good in the beautiful Piazza of St. Mark's (Fig. 6), from the centre of which the old Council building has an elevation of 29°, the new one less than 33° and the church less than 28°, whereas looking from the sides of the square across its length, the first two angles become respectively 16° and 18°.

In the Piazza Colonna, in Rome (Fig. 9), one sees from the Corso the Palace on the opposite side of the square, at a distance two and one-half or three times its height, and also the Column of Marcus Aurelius, 29m. high, at a distance of 40m. Hence a good view of both the palace and the column is obtained. The Cathedral Square of Milan (Fig. 40) has the proportion of depth to height of 3:1 (169m. to 56m.) but does not give a true impression of its size



Fig. 74. Domplatz, Regensburg.

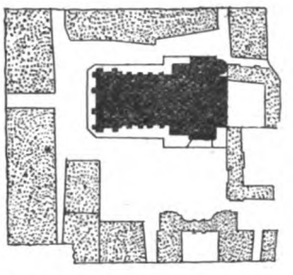


Fig. 75. Munsterplatz, Strasburg.

because here is lacking some intermediate feature to give scale, and the façade of the church is not sufficiently prominent with respect to the other high buildings. In the square of the Cathedral of Palermo (Fig. 41) one sees the building from the opposite side of the square at a distance which is somewhat less than twice the height, hence the impression is so much the more imposing.

St. Peter's, Rome (Fig. 7), when seen from the Piazza Rusticucci does not give the expected impression of immensity, for although the dome is 143m. high it is 420m. distant — about three and one-half times the height — while the façade is 340m. distant, almost two and one-half times the height; hence, the impression of the dome is picturesque in character, appearing as a part of the magnificent surroundings.

The Campidoglio, Rome (Fig. 10), and the Piazza dell' Annunziata, Florence (Fig. 8), illustrate the beauty of the proportion of height to length of one to two or two and one-half. The proportion of the Kaiserplatz at Strasburg being 1:4, it is not surprising that the palace does not produce from most points-of-view the desired majestic impression.

The Königsplatz and Friedrichsplatz, at Cassel, the Rathhausplatz at Vienna and the Szechenyiplatz, at Szegedin, show proportions of 1:8 or more. The reverse, a proportion of less than one to one of height of building to the distance across the square is found in the city-hall squares of Brussels and Cologne, as well as on the long side of the Cathedrals of Regensburg (Fig. 74) and Strasburg (Fig. 75).

It is evident that high tower-fronts, domes and cupolas, require a form of square that permits a greater distance from which they can be viewed. Long buildings, that are not very high, such as city-halls, museums and the sides of churches should be placed on the long sides of the square.

The St. Mark's Square (Fig. 6) is shaped with regard to the height of the Church at the wide end and the long and low civic buildings on the other sides. It would be a useless task to deduce standard rules for the proportions between the length and breadth of the square. Those which approach the square form, as in Figures 3, 8, 10, 11, 54, can be æsthetically as satisfactory as those which are rectangular or oblong (Figs. 22, 23). We have to consider solely the perspective impression which depends upon the point-of-view of the beholder, the building surrounding the square, and its adornment or decoration.

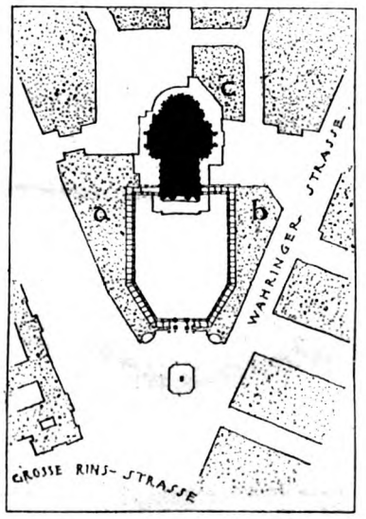


Fig. 76. Maximilianplatz, Vienna, Austria.

The more a square is elongated, the more it resembles a street — the limit of the elongation being probably marked by the Piazza Navona, Rome (Fig. 22), which has a proportion of 1:4, breadth to length. The so-called Friedrich Wilhelmplatz, at Aix-la-Chapelle (1:6), and the so-called Stäudeplatz, at Cassel (1:7), appears principally as streets.

The praiseworthy attempts to enlarge too narrow or restricted streets, to remove buildings that are too near or built against monumental structures, are at present found in Italy, France and Germany. But the opposite also occurs, the restriction of squares that

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are too large, in order to surround the monumental buildings with a closer frame.

The propositions of Sitte for restricting the surroundings of the Justice Buildings, Burg Theater, the City-hall and Votive Church, Vienna, by minor groups of buildings contain many artistic truths and for the development of the city plan, in the future, may prove to have fruitful results. Figure 76 shows a sketch by Sitte for the improvement of the Votive Church at Vienna. The large open place between the Ring Strasse and the Church and the smaller squares behind the choir, would, according to this scheme, be partly built upon by the blocks *a*, *b* and *c*, thus giving to the tower-front a monumental enclosure of proper size. There is a monument in front of this atrium, its entrance being flanked by fountains. At the back of the church there will remain an open place sufficiently large for viewing the choir and the intersection of the nave and transept, and at the side, a small square which permits a view of the church from the Währinger Strasse.

(To be continued.)

THE OWNERSHIP OF DRAWINGS MADE FOR AND BY AN ARCHITECT.[1]



House of W. H. Walker, Esq., Vancouver, B. C. R. Mackay Fripp, Architect.

A LETTER is a document which, by means of words, attempts to supply to the reader some information from the writer; even after signature this, until delivery to the Post-office, or until delivery by some other means (the difficulties respecting a letter *in transitu* need not here be discussed), is held to be the absolute property of the writer, unless by agreement he has previously parted with that property. After delivery (if there has been no such agreement), either party may by injunction prevent the publication of the document; but before proceeding to that step, in cases where the Post-office is not the medium of transmission, the delivery to the reader or to an agent specially appointed by him to receive the document must be proved by the recipient. An architect's drawing has the nature of a written document, and is invested with all the qualities of a letter, as soon as it has received his signature, or the formula, "To be returned to the office of A. B.," etc., or even "From the office of A. B.," etc. A drawing is any combination of two or more lines which expresses form more clearly than any amount of description could do. In exception to this definition, some persons might produce copies of photographic pictures, and inquire where the lines are to be seen; others might bring forward shadowed representations of buildings in which no lines appear. The reply is, that no man could have made such copy or such shadowed drawings without first drawing the lines, which have subsequently been erased.

Architectural drawings are technically known as "*Sketches*" of plans, or sections, or elevations, or perspective views; *Draughts* (this term is nearly obsolete, because the words "rough plan," etc., are too generally used in an office for "rough draught of plan," etc.), and sometimes scaled to a *modulus;* General Drawings, always scaled to a foot; Detail Drawings, either at full-size or at an aliquot part of that size; Show Drawings, for exhibition to the client, to the architect's friends and to the public; a drawing in any one of these classes may be either "rough" or "finished," but is not necessarily an original design — the words "design" and "drawing" are so frequently used with indifference as to their separate meanings, that it may be useful here to insist that a design means a project, an idea, which may be very good although expressed in a bad drawing, just as, on the contrary, good drawing may be wasted upon a bad design; and copies or repetitions, which may be either counter-drawn by transfer, or duplicates by tracing or by using the rule and compasses, or enlarged or diminished copies produced by hand or by machinery. The term "Working-drawings" once meant the general drawings drawn so large as to show construction, or to admit of minute dimensions to save mistakes by workmen unused to scales; but now all detail drawings may be included. As to Original Drawings, all from which copies are made are original: however, since an assistant's work has been allowed to pass under the master's name, an original drawing by the master is one which he has himself made. Competition Drawings are finished general (and sometimes detail) drawings submitted in competition with other architects; in a few exceptional cases drawings of the design to a small scale have been at first required, and a selection has been sealed, for verification by the advertising body, from which the larger drawings have been made, and again submitted in final competition. Prize Drawings are the successful Competition drawings, although the present day speaks of "premiated prize-drawings" when the competition has been made as a scholastic exercise for a small sum of money, or for a medal, or for books, etc., commonly called a "prize."

When the conditions of competition include a provision that the prize-drawings shall become the property of the donor of the premium, without the addition of words to the effect of "on delivery of the premium," the architect enters into a speculation of making drawings for approval, purchase and payment. The drawings on approval become the property of the donor of the premium, who in the present state of the law of artistic copyright has the power to sell, or lend, or publish them forthwith, without fear of any interference on the part of the architect, who must formally sue the donor for the premium as a debt, unless the architect by some indiscretion has deprived himself even of that remedy.

It is clear that a body corporate having a common seal may advertise for competition designs, receive them, approve two or more sets of drawings, and refuse to proceed to the adjudication of the premiums (on the ground that the advertisement was not a copy of a contract made under seal) until a more satisfactory opportunity; yet the architects cannot compel the body corporate to return the approved drawings; and it is doubtful whether they could compel them to proceed forthwith to adjudication and payment; yet the drawings would be legally in possession of the corporation, if not legally its absolute property.

The drawings made by an architect's assistant in the architect's office absolutely belong to the architect until he parts with his property in them, and this whether the assistant be paid (even if there be a debt due to him in respect thereof) or otherwise. This property depends on the fact that the drawings are made on paper, or vellum, etc., provided by the architect. Hence the clause in Articles of Pupilage that the pupil is to provide all instruments and materials except paper.

The drawings made by an architect's assistant out of the office, for the architect, absolutely belong to the architect until he parts with his property in them, even before he has paid to the assistant the price of the work. This property may arise in one of two ways: either the drawings are made on paper or vellum, etc., provided by the architect, in the same manner as a solicitor supplies to his surveyor the parchments on which the surveyor is to make duplicate drawings; or else the drawings have been made on paper or vellum, etc., *provided by the assistant*, and the architect, by agreeing to have them, acquires the property in them; but, in both cases, the assistant has a lien upon the drawings, or any part of them, for the whole price, unless he has agreed to receive the price at a future day, or takes security for the debt.

Not to omit what may at first sight seem to be an almost extinct branch of the subject, it may be observed that a century or more since, when vellum was more used, paper much dearer, and assistance perhaps worse remunerated than at present, agreements as to the usefulness of an assistant's work were settled by destroying the material, a habit said to have been preserved to his later years by Sir John Soane, who did not hesitate to ask the assistant or pupil for his penknife, with which Soane reduced, at two diagonal cuts, the drawing into four triangles. Even now, the destruction of a pupil's drawing is taken as the strongest mark of the architects disapproval. But, of late years, the principle *caveat emptor* has been so triumphant that if the architect does not take care to see satisfactory samples of his proposed assistant's skill, he had better not refuse an unsatisfactory drawing, but, (after pointing out the defects and getting them rectified as much as possible) accept, without manifesting displeasure, the finished work which is tendered to him. And if the architect, during the progress of work done out of the office, should see evidence of carelessness, incapacity, or ignorance, he had better say that the drawing at that stage will suit his purpose, as if it were completed; and, upon payment even of the price originally fixed, withdraw it. To leave a drawing under a continuous lien is not satisfactory.

An architect is paid for his services either by salary, by fee, by commission, or by time. The term "salary" applies to all payment (generally as an annual one) for continuous professional services necessary to the satisfactory discharge of the duties of the position held by the salaried architect, whether such services be rendered daily or only occasionally, and whether the hours of work be fixed or left to his discretion. There may still occur a case in which an amateur gives to an architect just free from pupilage a moderate salary

[1] During the period when the important subject of the ownership of drawings was under consideration — a question raised by the demand made by the Office of H. M. Works, etc., on the late Edward Barry, for the drawings made by his father in carrying out the designs for the House of Parliament — my brother, the late John W. Papworth, undertook to collect the views generally held by members of the profession, and wrote them out with comments. His notes, which were found, at his death, among numerous other papers in his desk, are given in the above posthumous article. See for other articles on this subject Vol. VIII, N. S., (Journal of the R. I. B. A.), pp. 169, 188, 231, 254, 404. — Wyatt Papworth.

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to look after an estate generally, and to assist in improving it and the mansion. In such a case, all finished drawings absolutely belong to the employer, whoever provided the materials, but they pass to the architect by verbal or written consent, being, in fact, a part of the patronage which supplies him with a portfolio of (not academical) drawings of work that has been, or has been likely to be, executed. All unfinished (in rough) works, such as dimensions in a note-book, measuring-book, or field-book, with calculations therefrom and abstracts thereof, belong to the salaried architect; he has always had it in his power to throw them aside (replacing, if necessary, the material) if he suspected them, and so preferred to take reproach of indolence rather than of carelessness, ignorance, or incapacity.

There is, next, the case of the amateur who takes into residence, or pays by salary, or both, a clever, but yet unsuccessful, architect to draw out what the amateur designs, or thinks he designs, or wishes to see designed and drawn. The patron will (perhaps jealously, certainly legally) insist upon securing every scrap of paper used by the architect in setting forth an idea, and every alteration suggested until the completion of the finished drawings, even if these run into complicated details at full size, or highly-finished perspective views. This patron naturally holds that it is not honorable in his salaried architect to make tracings of the finished drawings, either in or out of office-hours. This arrangement is sure to fail unless an office-room and fixed hours are part of the bargain.

The last phase of salaried business to which attention need be given here is that of the architect attached to a public building or institution. If he acts as steward, which in some places is part of the business, his ledgers belong to the office; and if his work includes building, his contracts and bills examined, or ready for examination, belong to the office. But at the death or departure of the architect, all rough work excepted in the positions above mentioned, ought not to be asked for by the client, who should be satisfied to think himself fortunate in getting any finished drawings made in explanation of the contract drawings for new works in progress. As to designs for new works proposed, the successor should prepare his own design for his own work, and not lazily avail himself of the labor (which he may misunderstand) of his predecessor, who, if alive, is not to be damaged in reputation by having his work spoilt, or if it be unsuccessfully executed, to be made responsible for the liabilities that may occur.

When an architect takes a salary for the guardianship of a building, the drawings which he may make of defects in the existing structures, for the purpose of pointing out them and the remedies, ought to remain in the office for his successors. But all drawings made outside the usual hours of work where daily service is required, or even (by open or tacit agreement for an equivalent) during those hours, or in the intervals of occasional service, for any object apparently connected with the salaried situation, but really foreign thereto, belong entirely to the architect until he parts with them for a fee or other consideration.

The term "fee" applies to payment for a report, whatever be the nature of the document, and whether illustrated or not by drawings. The property in finished work done for a fee is generally supposed to pass so entirely to the client when he accepts the work as to prevent publication by the reporter without the consent of the client, while any attempt on the part of the reporter to prevent publication by the client would be reprobated by his professional brethren. The plan, as of an estate, made by a surveyor is, in fact, a report of the shape, extent and nature of the estate, and the drawing is itself his report; but all wrongly-plotted plans or rough draughts belong to the surveyor, and would not be yielded to the client by any man of respectable position in business. If they were demanded by a troublesome client, the surveyor would probably destroy them, and communicate the fact of their non-existence as his reply to the demand. So, also, if an architect is required to report on the condition of a building, or part of a building, his rough draught of his report might be demanded by a troublesome client; and, inasmuch as the architect's first impressions might have been modified by subsequent surveys, the destruction of the rough draughts of reports would be prudential. Indeed, destruction seems to be the only way by which to promptly meet a demand for papers upon which statements apparently incriminating the architect or surveyor might be founded. It is for the *finished work*, not for the preliminary studies, that the amount of the fee is fixed; otherwise the architect or surveyor might tender the rough work, or studies, and require in exchange the fee; and the order of the client to stop and deliver the unfinished work on part payment of the proposed fee would be as futile in an action against him for the entire profit of the transaction as if he refused to accept the finished work without the rough work.

An architect's contract with his employer, where the former works on commission, is that the architect will make the usual professional charges, and will be liable to the client for any responsibility incurred by himself or assistants. But the client and his friends understand the matter very differently. They say: "Architect A contracted with friend B to build B a house for £900; yet it has cost £1,200 and ruined B." The architect says that there was not any contract in that case; that the original order was for a £900 house, that his original sketches were for a £900 house; that B, with his family, made additions in size and quality to match what they saw at their neighbor's; that the lowest tender was £1,200, and that B said, "Cut it down as much as possible, but I shall have something more like what I want than you at first designed"; and that, in process of construction, the builder gets orders from B to an amount that fills up the cutting down. Furthermore, our lawyers fall into the verbal trap, and insist on supposing that the architect's contract drawings bind him to the client; on the contrary, the client is bound by them to the builder, and the builder to the client, no variations being usually allowed unless ordered by the architect, or architect and client, in writing. When an architect takes a commission for the erection (I omit the words "the alteration") of a building, he undertakes the production of such a building to the best of his ability, which may improve as the work proceeds. He may write what directions he likes, and so describe his plan as to make a drawing unnecessary (remembering Michael Angelo's celebrated letter to Vasari about the stairs to the Florentine Library); or he may illustrate his letter with diagrams, or his diagrams may be so full as to leave little occasion for writing to it at all. Still his signature constitutes it a letter, for which he is responsible, and which, according to all the text-books on property, belong to the sender, not to the receiver; and, by the way, if a perspective view, highly-colored, be stolen, the value is that of the paper on which it is made.

These diagrams may be a plan, an elevation, a section, a perspective view in freehand or geometrical work; the size of the paper does not affect the fact that they are protected as letters so far that if a piratical publisher sought to print them he would be open to an injunction to leave out all the accompanying explanatory writing. Moreover, the illustrative details in other diagrams, drawn by another person not in the employment of the architect, become the property of the architect as soon as his signature thereto makes him responsible for the directions given thereon.

If the architect be represented as the owner, and the drawings in question have been appended in fact or in schedule to a contract, the thief may say that they are the client's property (it will be impossible to deny that a contract is the client's property), and so escape conviction; on the other hand, if the client be represented as the owner, and the drawings in question never have been appended in fact or in schedule to a contract, the thief may say that they never were the client's property, or at least, that they are the joint property of the architect and client, and so escape conviction. In both these cases it must be observed that the indictment will be framed for stealing the papers (say value 40*s.*), and not for stealing the drawing (say value £4 or £40), by which the property in the papers is proved. Under peculiar circumstances (if known to the thief) a third line of defence might be taken; for he may say that the drawings, having been sent by the architect to the client for transmission to the builder, had become the joint property of the architect and client and so escape conviction.

The subject of the joint property of the architect and client in a drawing is one of the highest importance. An architect's drawings for a work executed upon commission, say of five per cent, appended in fact or in schedule to a contract, have the nature of a written document, and are liable to be stamped accordingly: it will be impossible to deny that the contract is the client's property; the property in the drawings passes, with the implied consent of the architect, entirely to the client, who in the present state of the law of artistic copyright, evidently has the power to sell or lend or publish them, as well as to use them again for another locality. The practice is, of course, reprobated by the profession, which herein cannot help itself.

An architect's drawing for such a work not so appended to the contract, whether made before the contract is signed or at any time subsequently, is an explanation of the subject of the contract, and is as entirely his property, to deal with as he likes, as if it were blank paper, until the moment that it leaves his office with his signature authorizing the execution of the work in the way there shown, at which time it becomes invested with the character of a letter. If any number of copies of such a drawing may have been made in the office, they still remain the property of the architect, even when he has selected the best executed among them for signature for transmission, and he may put them as patterns before his pupils for further copies, or he may publish them. The client has no power to interfere.

Moreover, if the architect chooses to tear up, not only his sketches, but his finished drawings, one after the other, as soon as the works which they show are executed, it might not be prudent, but is clearly within his power to do so. If Sir C. Barry neglected, before his decease, to destroy his papers, that neglect did not transfer his right to burn them to the Government. If a member of the Government had chosen to order Sir C. Barry to deliver up, from time to time, his sketches and drawings, so that they might be officially destroyed, the matter would have been so ludicrous that it could not have been sustained. Official destruction is not so far from official preservation as might be supposed. The Government itself cannot produce all the drawings made by its salaried officials from the Fire of London to the Reform Bill.

From the first sketch of the ideas of an architect working on a payment by commission, to the picture representing the extent or intended result made by an artist for the architect, the paper on which those drawings are made remains the property of the architect, not of the client, and can be transferred by the former to any one; and further, the client has no right to select such as he would like to possess, even if he tender the value of the materials and workmanship. — *A paper by the late John W. Papworth, published in the Journal of the Royal Institute of British Architects.*

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SOCIETIES

ENGINEERS' CLUB OF PHILADELPHIA.

AT the regular meeting, February 17, 1894, Mr. John C. Trautwine, Jr., called the attention of the meeting to an interesting problem which occurred in supplying the village of Frackville with water from the Mud Run Reservoir in Schuylkill County. The water was fed through a 10-inch pipe, for a distance of 8,000 feet, to locomotives and fire-plugs in the village. The fall in the pipe was 40 feet, and the head in the reservoir 20 feet. At the village, this pipe separated into two branches of 6 inches in diameter, one, 3,200 feet long, running to the village of Mahanoy Plain, with a fall of 340 feet, and the other, about 1,500 feet long, running to the head-house of the plain, and in this distance first rising 2 feet, then falling about 10 feet to the upper story of the head-house, and fifteen feet further to the cellar.

The difficulty experienced was, that owing to the much greater head in the long pipe, the valley at its end got all the water, leaving practically none for the head-house at the top of the plain.

Mr. H. K. Nichols, Chief Engineer of the Philadelphia and Reading railroad, remedied the trouble by the simple expedient of introducing in the long pipe, just below the branch, a siphon about 18½ feet high, provided at the top with a blow-off cock, by which the air is allowed to escape when it accumulates in too great quantities.

Mr. Trautwine's remarks were followed by a considerable discussion on this and other interesting instances met with in hydraulic practice.

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

HOUSE OF DR. H. M. JERNEGAN, COMMONWEALTH AVE., BOSTON, MASS. MR. GEORGE A. AVERY, ARCHITECT, BOSTON, MASS.

[Gelatine Print, issued with the International and Imperial Editions only.]

VANDERBILT DORMITORY FOR YALE COLLEGE, NEW HAVEN, CONN. MR. CHARLES C. HAIGHT, ARCHITECT, NEW YORK, N. Y.

THIS building, now nearly finished, has been erected by Cornelius Vanderbilt, Esq., as a memorial to his eldest son, who died a year or two ago while a student at the college. As the young man had been greatly taken with the character and arrangement of the Oxford halls, pains have been taken in this building to give heed to his predilections in the design and plan.

FIRST ENGLISH LUTHERAN CHURCH, CINCINNATI, O. MESSRS. CRAPSEY & BROWN, ARCHITECTS, CINCINNATI, O.

THE First English Lutheran church, about to be erected, will cover the entire lot, which is eighty feet on Race Street and ninety-five feet deep. The church will be top lighted and will be in all respects a complete modern building. The front is to be of red stone and the treatment is of purest "Gothic."

PRELIMINARY SKETCH FOR HOUSES AT WASHINGTON, D. C. MR. WM. J. MARSH, ARCHITECT, WASHINGTON, D. C.

IT is proposed to build the front of these houses with Indiana limestone and Harvard water-struck red bricks laid with white-lime mortar joints. Brindled roofing-tiles and white-pine interior finish, except for the staircases. Estimated cost $19,000.

HOUSE FOR GEORGE BULLOCK, ESQ., OYSTER BAY, L. I., N. Y. MESSRS. STICKNEY & AUSTIN, ARCHITECTS, BOSTON, MASS.

AMERICAN INSTITUTE EXHIBITION BUILDINGS, NEW YORK, N. Y. MESSRS. ROMEYN & STEVER, ARCHITECTS, NEW YORK, N. Y.

[Additional Illustrations in the International Edition.]

WORK-HORSE AND FARMER GROUP IN THE COURT OF HONOR, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MESSRS. D. C. FRENCH & E. C. POTTER, SCULPTORS.

[Gelatine Print.]

STATUE OF AUGUSTUS, NORTH FRONT OF FINE ARTS BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL.

[Gelatine Print.]

THIS statue is an enlargement of the marble figure of Augustus, found in 1863 in the ruins of the Villa of Livia at Porta Pia, near Rome. The original is now in the hall of the Braccio Nuovo in the Vatican. "A noble witness to the technical excellence of sculpture in the Augustan age," the figure measures nearly seven feet in height, exclusive of the plinth, and bears distinct traces of color. Its date is set down as about 20 B. C. The only restorations which it has undergone are the sceptre, the forefinger of the left hand and part of one ear.

DRAWING-ROOM, 49 PRINCE'S GATE, LONDON, ENG. MR. R. NORMAN SHAW, ARCHITECT.

No. 49 Prince's Gate was the town-house of the late Frederick R. Leyland, a Liverpool merchant-prince, and once held his remarkably fine collection of paintings old and new, of which the special glory was the Botticelli's and Rossetti's, all since sold at Christie's.

Famed as the mansion was for these pictures, it was, perhaps, even more widely noted for its dining-room, known as the "Peacock Room."[1] "This description," says the *Pall Mall Budget*, "it owes to the decoration with which Mr. Whistler has enriched the walls. The general color-scheme of the room is turquoise-blue and gold, and the only ornaments are pieces of blue and white china, displayed on shelves of carved and gilt wood. The room, as it was originally conceived, was hung with Spanish leather and it was by a mere fluke that Whistler came to decorate it. The story is as follows: Mr. Leyland, having purchased a picture by Whistler, representing a damsel in a Japanese robe, hung it over a fireplace, where it still remains. Mr. Whistler, having inspected the arrangement, complained that the red flowers scattered over the gold ground of the Spanish leather hurt the harmony of his picture, and proposed to paint them out. Mr. Leyland gave a thousand pounds for his Spanish leather, but he nevertheless allowed the impressionist leader to have his way, whereupon Whistler went on painting and painting until the Spanish leather disappeared entirely and a new and absolutely unique decorative scheme of blue-and-gold, in which the chief *motif* was peacocks and their feathers, appeared in its place. Walls, woodwork and ceiling are entirely covered with these Japanese compositions. Over the buffet at the end of the room, opposite the fireplace, is an oblong panel, sixteen feet long, where Mr. Whistler has depicted two peacocks in aggressive attitudes, designed in gold on a blue ground. One peacock of unruffled elegance is supposed by some subtle interlinear readers to represent the artist, and the other peacock with disordered plumage and irate mien, standing on a pile of shekels, is identified with the artist's patron. The background is dotted with flying feathers and masses of gold, and the whole composition has reference, we are told, to a difference that arose between the artist and the late Mr. Leyland with respect to the cost of the work. This cryptic panel was the painter's vengeance, but its hidden meaning is so discreetly concealed that it would remain lost in the spirited charm of the whole had not anecdotic memories treasured up the souvenir of the artist's wrath and of its ingenious manifestation. It is a remarkable fact that besides estranging Whistler and Mr. Leyland, the "Peacock Room" had a far more tragic consequence. Mr. Jeckyll, who had designed and completely finished the room when Mr. Whistler appeared on the scene, had already suffered several disappointments owing to accident having deprived him of the credit of his work in Mr. Leyland's house. When Mr. Jeckyll saw the Spanish leather disappear and the peacock harmony in blue-and-gold become the talk of London, he went home and commenced to paint the floor of his bedroom gold, and in a few weeks he died, insane, in a private lunatic asylum."



Shutter in Dining-room.

Jeckyll is said to have been the first to introduce into England

[1] See also *American Architect*, March 24, 1877.

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(after the Paris Exhibition of 1867) that Japanese manner of decoration which he also made use of in some of the rooms of Mr. Alexander Ionides's house in Holland Park, Kensington.

HALL AND STAIRCASE IN SAME.

THIS staircase, which is of marble with gilt bronze balustrade, came from Northumberland House, having been bought at the sale of the materials of that mansion in 1874.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

MR. ORD AND THE PHILADELPHIA PUBLIC BUILDING.

PHILADELPHIA, PA., February 24, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In the confusion incidental to moving my office, I regret that I overlooked the notice of what you style my "unfortunate misunderstanding" with the Philadelphia Public Buildings Commission in your issue of February 17, until my attention was called to it yesterday morning.

As you very properly state, it "seems to convey a lesson to other architects who may be employed upon public work," but as your history of the case is not quite correct I desire to furnish one that is correct, as well as concise.

The Requisition of the Commissioners upon the City Councils for funds for the year 1894 — with which I was perfectly familiar, having assisted in its preparation — called for $1,426,425, besides $405,935.52 to cancel outstanding Certificates of Indebtedness, making a total of $1,832,360.52 and included as part of "Item I, for Salaries" the usual provision (of 10-years' standing) of the sum of $9,600 (not $7,500 as you have it), for the salary of the architect, also $3,300 for draughtsmen, and $1,200 for a clerk for the president. The total amounts were given to the City Controller on August 15, and the Requisition itself was formally transmitted, by the President of the Commission, to City Councils on September 5, 1893.

Subsequently, as all constructional work upon the buildings was suspended for want of an appropriation, salaries were reduced, and among others, that of architect from $9,600 to $4,000; and I was elected to serve at that rate till the end of the year 1893 only, by which time the appropriation for 1894 was expected to be available. [The officers are usually elected in October to serve till the following October.]

When the City Councils reached the consideration of an appropriation to the Public Buildings, they found that they could not give the full amount asked for, viz, $1,426,425 (the outstanding certificates having in the meantime been provided for by a separate appropriation of $405,935.52), but, instead of making a formal communication to the Commissioners, the chairman of the Sub-committee of Finance called informally upon the secretary and architect, in person, to inquire as to what could be done with $750,000, which amount he thought the Councils were able and willing to appropriate. In hastily itemizing, for *him*, that amount, and in view of the active resumption of work upon the buildings in 1894, which would render necessary a great deal of work in the architect's office, I sought to provide for the Commissioners, a sufficiency of money, with which to secure competent architectural service, and included a maximum amount of $7,500 as the possible salary of the architect, and also the sum of $1,500 for a draughtsman, besides $1,200 for the clerk. I had no reason to believe (and have none now) that the $4,000 salary had been adopted as a permanent allowance, and was perfectly alive to the fact that my suggesting the appropriation of $7,500 did not in any way bind the Commission to adopt it unless they thought proper, afterwards, to do so. And I venture to think, and to say, that I appreciate the magnitude of the work and the responsibilities of the position a great deal more than some of those more directly responsible for it.

I reported my action at once to the president and it also came informally to the knowledge of others of the Commission while there was yet abundance of time to make any desired changes; but it was deemed of no importance until, later, private politics meddled with it, and it became absurdly magnified and misrepresented.

I was not dismissed from office, as my term had already expired; and in electing my successor it was quite unnecessary to make any remarks, to say nothing of the alleged charges of the newspapers; and as a matter of fact, there is nothing on the minutes of the Commission to show that anything was said.

It may be interesting to the profession to know that the Commissioners have paid for architectural services from 1872 up to September 30, 1893, the sum of $282,936.05 (or an average of $13,000 per annum), which is equal to 1.82 per cent upon the *net* cost of construction, which has been, to January 1, 1893, about $15,007,426.36. Even these rates are much below what the city, county and State officials pay to architects directly employed by them.

For the last ten years the architect of the Philadelphia Public Buildings has paid for all his own stationery and other office-supplies; and it now is made to appear that he has in addition to pay his draughtsmen out of the reduced allowance of $4,000.

JOHN ORD, F. A. I. A.

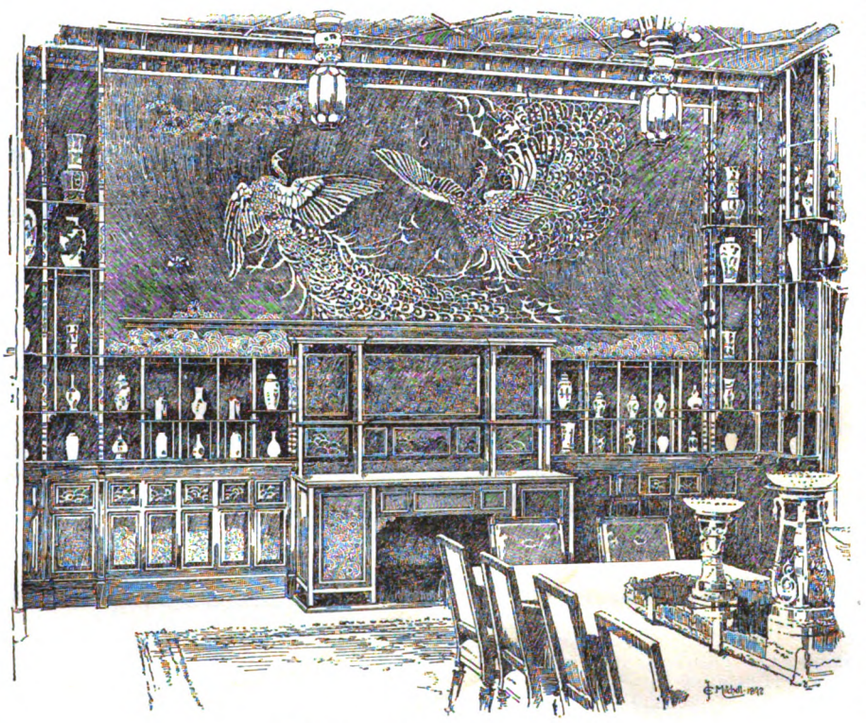
[WE regret that we characterized the severance of relation between Mr. Ord and the Public Building work as a "dismissal." — EDS. AMERICAN ARCHITECT.]

ACOUSTICS.

BOSTON, MASS., February 9, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I noted in your issue of November 11 last, page 80, a clipping from the *Architect and Contract Reporter* giving the rule for a cross-section of an auditorium — as a principle of good acoustics. The said citation assumes (its general intent, as I take it) that the said rule is of universal nature, applicable in all cases. It is not so, and it suggested to me that a few words upon the subject might not be wholly uninteresting to your readers.



Dining-room, 49 Prince's Gate, London.

This is not intended, by any means, to be an essay on acoustics — both time and space forbid — but simply to state in as few words as possible, why the rule or principle referred to is misleading and will not answer in all problems, and to outline some of the primary laws and elements which enter into a problem of acoustics; such as I have considered and followed in my own practice, with gratifying results.

1. — As to the rule above noticed: if the same is of general application, then auditoriums, churches, theatres, music-halls and the like, would have to be of much less height than they now are; otherwise they would not be good acoustically (which some are), or the platform or stage would need to be much elevated above the average level, and the ceiling of the barrel-vault type. For, according to this rule, in an auditorium (theatre, for instance) 78 feet wide and 65 feet high — an average size — the speaker's mouth (the phonic centre) would need to be 26 feet above the floor. We know that such is not the need. On the other hand, assuming this rule to be in force, an auditorium 78 feet wide would call for a height of about 47′ 8″.

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The fact is, that the rule referred to is one of minor importance — applicable, with good results, under certain conditions, but not at all necessary under other conditions; these other conditions affecting this special rule vastly more than it can possibly affect any given case. Acoustic results depend almost as much upon knowledge of the various *materials* entering into the construction and finishing of an auditorium, as upon a thorough knowledge of acoustic laws governing the propagation, reflection, or augmentation of sound.

I know of no science, in connection with our art of architecture, in which the truism of the old saying "a little knowledge is a dangerous thing" bears more directly than in this matter of acoustics, and the average practitioner will need to go but a short span over the road of research which I have travelled, to convince him of this.

2. — Assuming that the genesis of sound is of right quality, *i. e.*, as to *purity* and *normal* intensity, whether of speaking or music, oral or instrumental, there are certain fixed laws which govern its transmission and diffusion, and certain elements which affect its purity, harmony and right hearing, and briefly they are stated as follows:

(*a*) *Pure* air and a normal temperature of 70°.
(*b*) Uninterrupted transmission.
(*c*) Sympathetic, *i. e.*, harmonious, vibration.
(*d*) Minimizing of reflection.
(*e*) Prevention of echo.
(*f*) Diminution of sound, when necessary, *i. e*, when the size of the auditorium is considerably within the limits of natural radiation.
(*g*) Augmentation of sound, when necessary, *i. e.*, when the size of the auditorium is considerably in excess of the limits of natural radiation.

As to natural radiation of sound: the Greeks well understood its phenomena, and the plans of ancient theatres are laid down accordingly (as to which the reader is referred to Stuart & Revett's "*Antiquities of Athens*," Vignola, Sanders, and an interesting work [in Italian], "*L'Acoustica*," by Antonio Favaro-Torino), and may be briefly stated as follows: Inscribe an area with a circle having a radius of 60′ 0″; then placing the phonic centre, *i. e.*, the speaker, 30′ 0″ from the periphery, the sound (*i. e.*, of normal speaking pitch), will be heard 90′ 0″ directly in front of the speaker, 30′ 0″ back, and 52′ 6″ directly upon either hand; in other words, a row of hearers standing in line around the periphery will hear the speaker, with equal distinctness *in pure air at* 70°; as the hearer recedes from — gets outside of, the periphery, so will his sense of hearing decrease, or, in other words, the sound fail to reach him.

As to (*a*), transmitting medium: the velocity of sound is conditioned upon the elasticity, or density (purity) of the medium — air, the greater the elasticity the greater the velocity; the greater the density (impurity), the less the velocity. Sound travels faster in warm air than in cold, and at a rate of 1,130 feet a second in pure air at 70°.

The clearness and purity of sound is conditioned upon the equality of its vibratory transmission, and this equality of vibration can only be maintained in air of equal elasticity and purity; so that uniform temperature and purity of air is one of the first essentials for the equal transmission of sound, not only in spots but throughout every portion of an auditorium.

This condition can only be obtained by a perfect system of heating and ventilation, and such a system should help, not retard, transmission. If the direction of the heating or ventilating currents is towards the stage, transmission and vibration will be retarded, and *vice versa;* the direction of such currents should be along with the direction of the sound-waves.

As to (*b*), uninterrupted transmission: *free space* should be provided for the transmission between the genesis of sound and the auditors; *solid* features, like columns, partitions, balcony-fronts, etc., should be rigidly avoided; balcony-fronts should be of perforated iron or wood work (wood is best), to prevent reflection and to admit of the sound-waves passing through and being absorbed by the clothing of the audience; and in the case of partitioned boxes, as in an opera-house, the partitions should be on radial lines from the phonic centre.

As to (*c*), sympathetic, *i. e.*, harmonious, vibration: the propagation of sound is by multitudinous waves sent out in all directions from the genesis of sound; (a simple illustration is afforded by dropping a pebble into water, though this is not an accurate illustration, inasmuch as the sound-waves do not expand in the form of rings, but rather in the form of millions of lines having wave-motion in transmission). These waves or lines, have an undulatory, or vibratory movement, of periodic extent and amplitude, and this extent and amplitude of the wave is governed by the force, intensity, pitch or initial vibration of the particular note creating its corresponding wave in the air; consequently, (1) the air must be in a condition to vibrate sympathetically with the initial vibration, and (2) as the waves are of periodic extent and amplitude, it is *necessary* that the dimensions or scale of the auditorium shall coincide in every direction, as far as possible, with the extent or scale of the vibratory motion or waves; for instance, the French standard pitch *C*, of 512 vibrations per second, propagates a wave whose extent is $2\frac{207}{1000}$ feet; therefore, it follows, if this note *C* is taken as the "*fundamental note*" of the auditorium, the scale upon which such an auditorium must be designed must be of a unit of $2\frac{207}{1000}$ feet, and the shape of the auditorium should conform to the extent, or end, of the numerous radiating waves, in musical progression, *i. e.*, in a ratio of 5, 6, 7, 8, 9, etc.; and if this ratio of proportion is adhered to, the forces of impact of the waves upon the enclosing surface (or in other words, the force of reflection from such surface) will be equal in all parts, and reflection may be prevented. Further, the form of the ceiling should not be flat, but curved, but the line of this curve cannot be any curve or series of curves which the architect may think "looks well," but is determined by the height of the centre of the ceiling above the floor *and its distance from the phonic centre*, and this initial curve will not coincide with the plane of transverse section of the house, but must coincide with the plane of a line or wave radiating from the phonic centre to the centre of the ceiling. The acoustic faults of the Trocadéro at Paris, are almost wholly due to the faulty lines or shape of the ceiling and the stage opening — being of such contour as to aggravate reflection and to concentrate reflected waves at certain places in the house.

As to (*d*), minimizing of reflection: this is an element which can hardly be set forth clearly in writing; (1) because even a slight variation of the lines of an auditorium will change the angles and force of reflected waves; (2) because reflection will largely depend upon the nature of the *materials* used in finishing and decorating the interior, a most important consideration, of which knowledge can only be gained by experience, observation and study; but the following general principles may be stated: (*a*) that hard or smooth surfaces reflect more and with greater force, than rough or soft ones; (*b*) that the angle of reflection is the same as the angle of incidence; (*c*) that reflection will be more powerful within limits considerably less than those stated in the seventh paragraph, and less powerful when the limits exceed those stated as aforesaid; (*d*) that much study needs to be given to the shaping of the plan and the elevation of walls, and other parts, to prevent reflected waves coming in contact with direct waves; (*e*) that balconies, if properly designed, are a great help in preventing reflection, their lines depending on the distance from and height above the phonic centre, and their projection from the walls; and utmost care should be taken that the height of wall back of and above the upper balcony be so designed that waves may not be reflected from said wall *to the ceiling*, and as before stated, the balcony-fronts should be in all cases open-work, not solid.

Care should also be taken that the plan, section and opening of the stage (the focus of genesis) are of such contour that direct waves will not strike the ceiling forward of the centre, *i. e.*, between the centre and the stage wall, or proscenium.

As to (*e*), prevention of echo: what I have observed, in the forepart of the preceding paragraph, holds good as to echo; no fixed rules can be written as to its prevention. Echo is due to reflection, and to the intensifying quality of resonant materials injudiciously placed. Possibility or probability of echo can only be determined, graphically, by laying out the direct waves, reflected waves and succeeding reflections.

As to (*f*), diminution of sound: it will be easily understood that there will be a preponderance of sound (of given intensity) in an auditorium, say, 60′ 0″ in diameter, over one of 120′ 0″ diameter, and that the force of reflection will be much greater; it is, therefore, necessary to so construct and finish the auditorium that resonance will be reduced and reflection prevented.

As to (*g*), augmentation of sound: it will be easily understood that there will be a diminution of sound (of given intensity) in an auditorium, say, of 240′ 0″ diameter, inferior to that in one of 120′ 0″ diameter, and that the force of reflection will be much less; it is, therefore, necessary to so construct and finish the auditorium that it will be of augmented resonant quality; sometimes powerful resonators are necessary, as, for instance, a sounding-bell, below the floor of the auditorium. The stage also must be planned and constructed in the form and nature of a great resonator, so as to augment the genesis, timbre or power of sound.

These elements of transmission, reflection, echo, diminution, or augmentation of sound are of vital importance in any attempt to design an auditorium, to be a success as regards acoustics, and demand of the architect not only something more than a superficial knowledge of acoustic laws, but also a knowledge of the influence of the various materials which he may be led to employ in the construction and finishing of an auditorium, and the manner in which such materials may be used to the best advantage.

John Lyman Faxon.

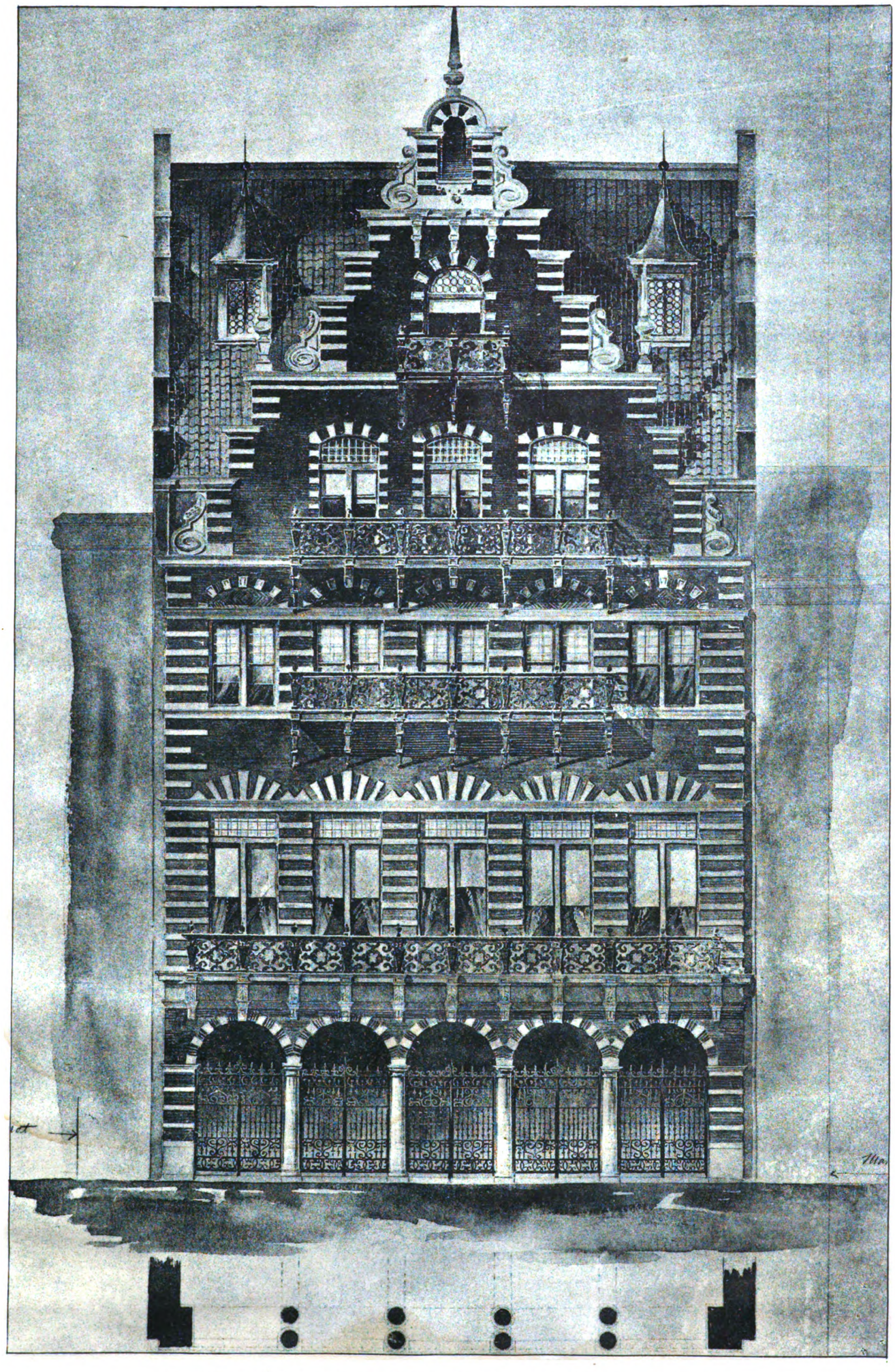
NOTES & CLIPPINGS

Mme. Naya. — One of the most enterprising women of the Continent was Mme. Naya, widow of a French photographer of the name, and wife of the sculptor Dal Zotto, who died in Venice last month. About twenty-five years ago she decided to make a series of photographs of the treasures of Venice — buildings, bridges, pictures, etc. She was remarkably successful, and sold thousands of photographs. She left a fortune estimated at many millions She married the well-known sculptor, Dal Zotto, a few years ago, and her house soon became the trysting-place of the art and literature circles of Venice. She helped hundreds in various ways and great regret is felt at her death. — *N. Y. Times.*

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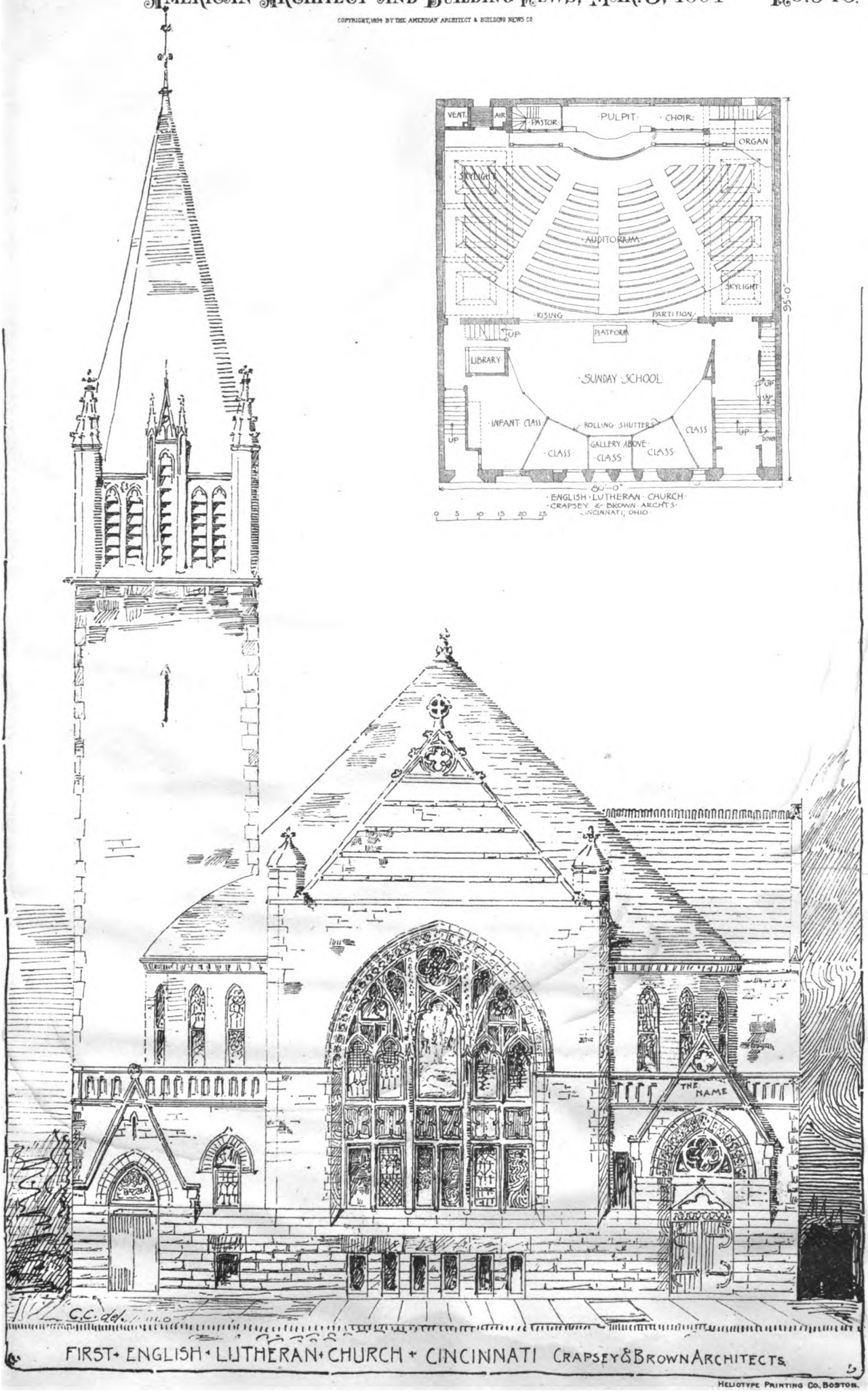
ENTRANCE FACADE TO THE AMERICAN INSTITUTE EXHIBITION BUILDINGS, NEW YORK.

ROMEYN & STEVER, Architects.

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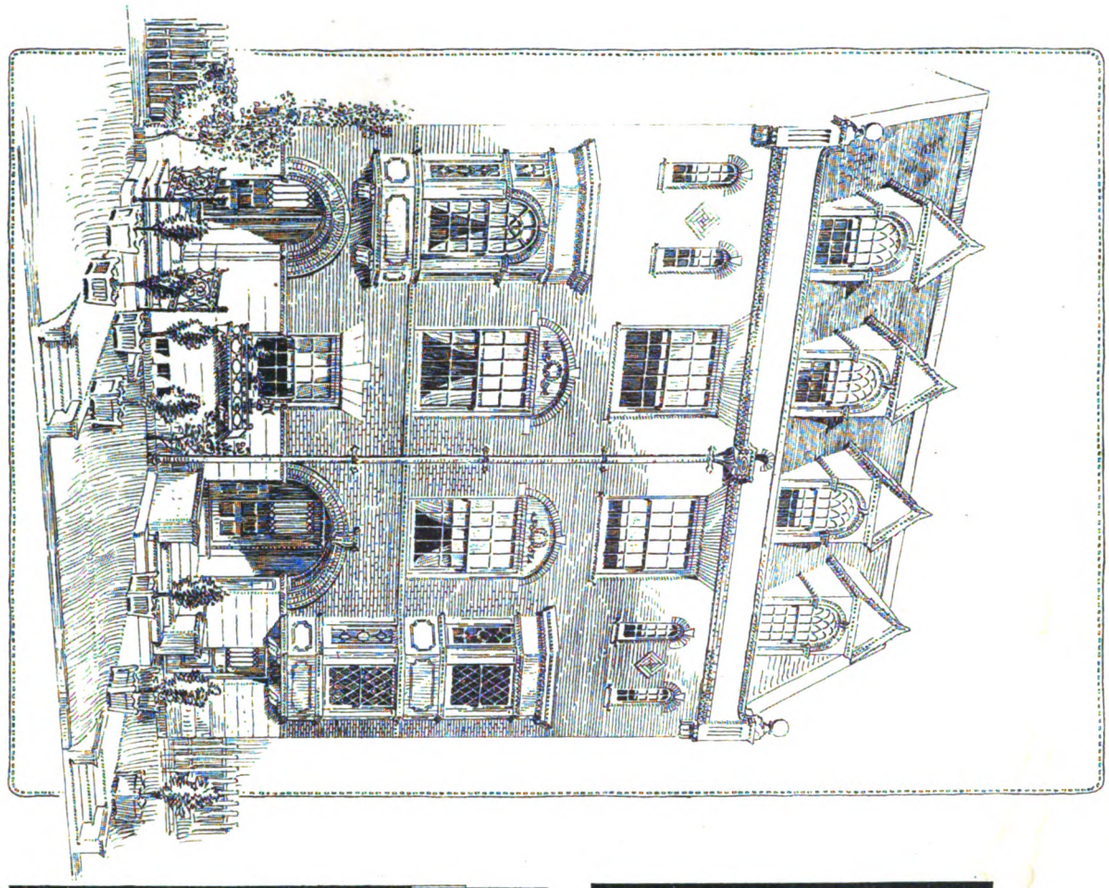
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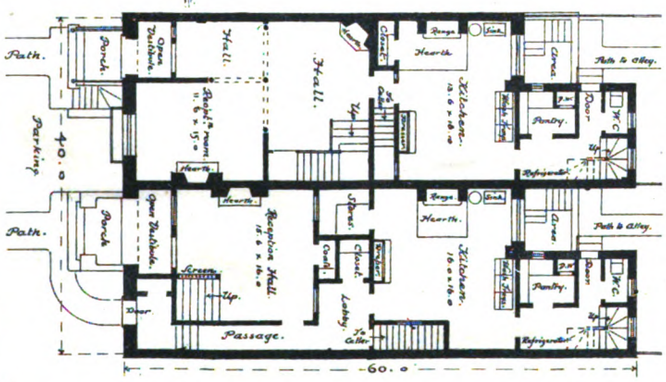
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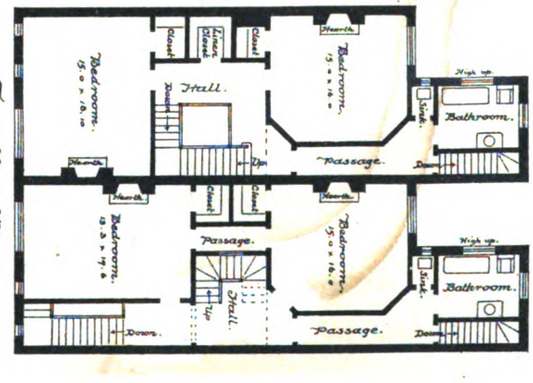
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Preliminary Sketches for Houses at Washington D. C.

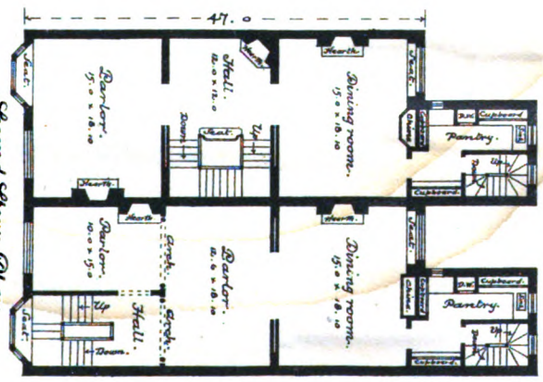




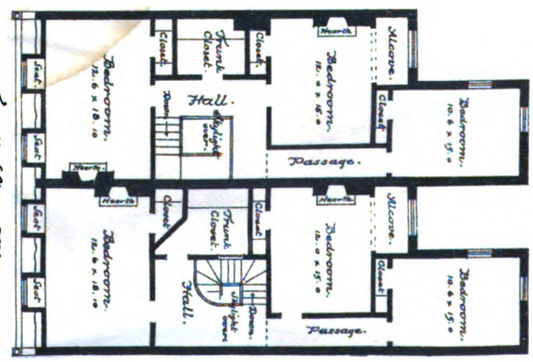
Third Story Plan.



Second Story Plan.



Fourth Story Plan.



Wm. F. McLaren, Arch.t
1503 Penn.a ave. Washington, D. C.

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A HOUSE AT OYSTER BAY L.I.

FOR MR GEO. BULLOCK.

STICKNEY & AUSTIN
ARCHTS BOSTON & BWELL, MASS.

FIRST FLOOR PLAN.

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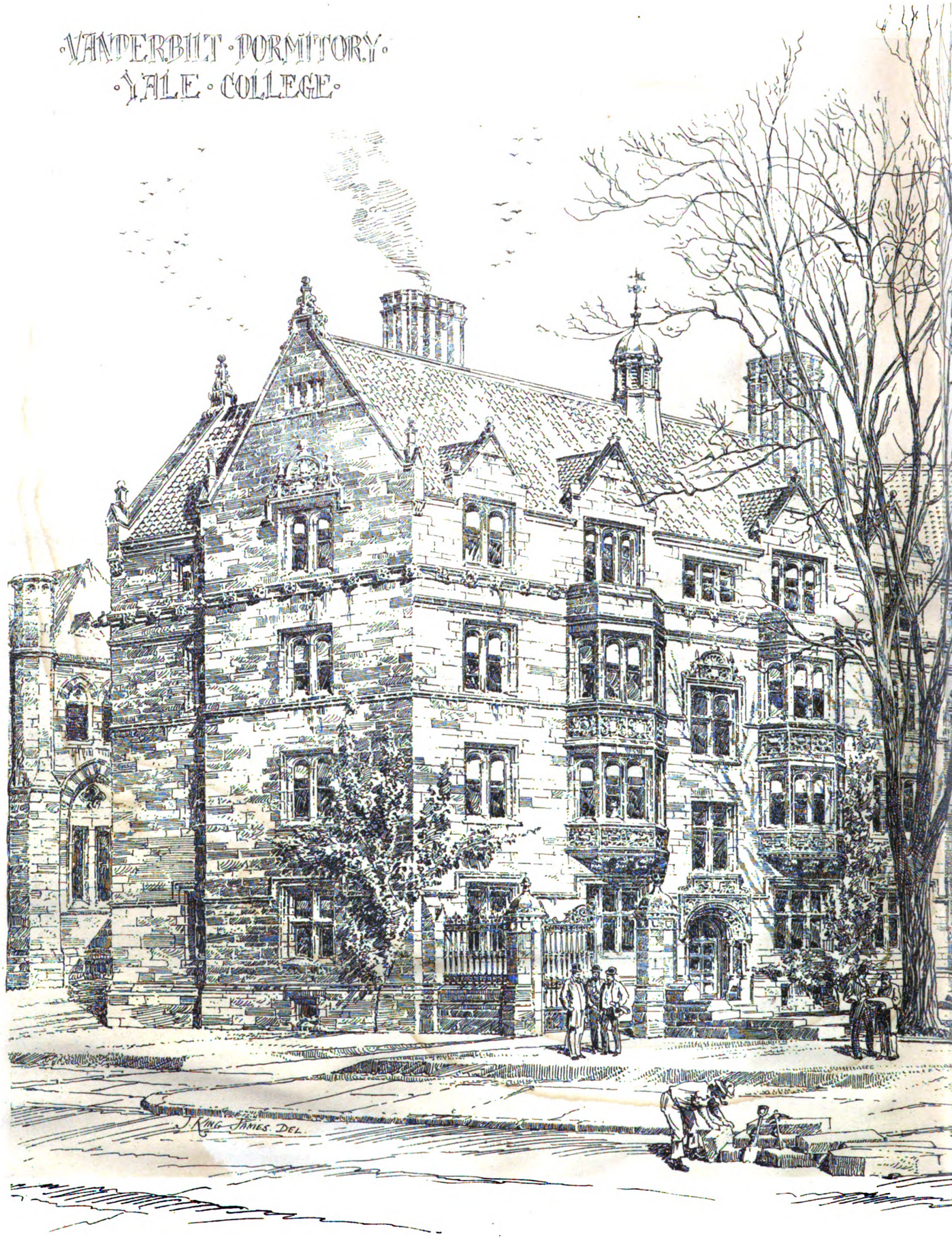
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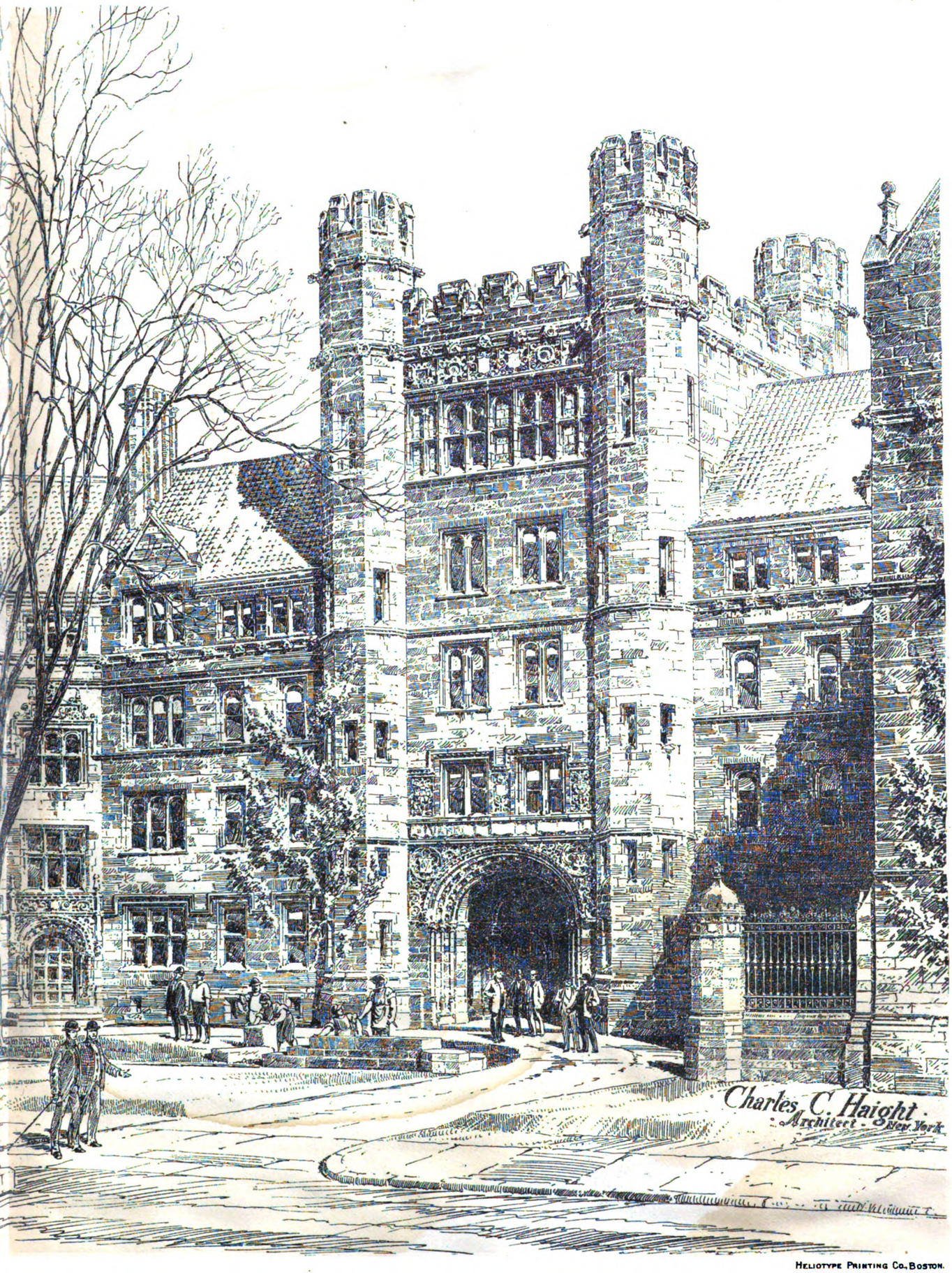
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MARCH 10, 1894.

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Additional: Moorish Fireplace in the House of Henry G. Marquand, Esq., New York, N. Y. — The Vermont State Building, World's Columbian Exhibition, Chicago, Ill. — Halton, Herts, Eng.: The Entrance-hall. — Show-room in Duke Street, London, Eng. 118

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NOTES AND CLIPPINGS. 119

THE attempt to preserve the Boston State-house on the one hand and the counter attempt to do away with it on the other, in favor of an elongation of what was intended to be a mere annex, bid fair to result alike in architectural failure, unless the friends of the present building can bring to pass that the new extension shall be, as it was intended at first to be, one integral and independent structure and Bulfinch's building another independent structure, the two connected together by the most appropriate architectural hyphen in the shape of a bridge or tunnel that the architect can devise. Such a solution of the controversy would be much more unfortunate for the new building than for the old one, and we do not wonder that the architect and the commissioners are making every effort to prevent an outcome so distressful to them. But their opponents have all the arguments in their favor, while, practically, the best argument the commissioners have is that if this is to be the result, then all the money spent on the Extension has not produced the effect that might have been secured if it had been known that the public was not to be cajoled into giving up the old building, which Bostonians hold in higher esteem than they had supposed. The present situation is in a manner quite unexpected, for even those who were most interested in the subject imagined that, in some way or another, the architect had provided a proper hyphen, and there was no reason to seek to know just how it was to be employed; but when the buildings on the east side were cleared away, and people had a chance to see the east front, it was at once plain that things had, behind the high fence, arrived at a very dubious stage. Taken as it stands, this east front seems to suggest nothing so much as that it was the designer's original intention to do away absolutely with the old building and to repeat at the south end the treatment employed at the north. Doubtless this may not have been the architect's real intention, for it could hardly have been known at the time the design was prepared that a park was to be made on the east side which would expose that part, instead of leaving it to the seclusion of a narrow street. Still that is the way the matter does look, and it is only one of the misfortunes which have fallen on the architect. Another is said to be that the Extension, if kept to what was understood to be its original lines, does not afford the necessary accommodation, and offers no chance for future growth of the departments housed in it.

OUR own position on the question is this: We have expressed our great regard for the old building and the traditions and memories that centre about it, and have declared that as a landscape feature it is most important for the identification of Boston, though injured now by certain too-lofty buildings near it. We have called the dome and its supports a fire-trap and protested that it ought to be replaced in proper materials. We have spoken of the Extension as the too-large tail for the little dog at the top of the hill, and may, with equal disrespect, have likened it to a tender too large for the wood-burning locomotive that was trying to pull it up hill, but these mild jibes were aimed, not at the architect, who was working under a programme laid down by law, and had a most difficult problem to handle, but at the concrete results attending the solution of the problem. There appear to be now three ways of extricating ourselves from the difficulty. First, by keeping the buildings separate and integral, and spending a portion of the money which the commissioners seek to spend on a new southern end in enlarging the Extension and giving it a proper façade on Mt. Vernon Street. Second, by keeping the buildings separate and integral, but spending nothing on the Extension for enlargement. Or, third, by taking ten million dollars and building on the enlarged site of the present building a State-house which shall reduce to a proper state of subordination the new Extension which, if it should ever be connected with the old building, would overpower it and be architecturally unsuccessful.

MR. ST. GAUDENS has at last, according to the newspapers, consented to remodel his Columbian-medal figure in accordance with the laws of American decorum, not only putting clothes on it, but, if requisite, adopting a new scheme altogether. Certainly the public is to be congratulated on this determination. A figure cut on a die by one artist, and furnished with clothes by having them dug out by another, would be a pitiable object, and, as Mr. St. Gaudens probably feels, it would have been better to throw the design aside altogether than to mangle it in such a way. We notice that some of the newspapers, in mentioning this new development, have furbished up the old theory, that Mr. St. Gaudens, although a great sculptor, "is by no means the greatest medal-maker" that this country has produced, and that owing to his "want of familiarity with technical points," . . . "the net result of his work, might, therefore, not be so good as the result of the work of some inferior artist, who thoroughly understands die-cutting," and so on. It is about time for artists in this country to interpose to contradict this notion, which has been used to suppress good artists and good art, as we suppose, ever since the world began. There is a story of a musician, we think Handel, who was found by some critics playing to himself portions of one of his new compositions. The critics, on listening, were filled with horror, and pointed out to him the gross violations of the technical rules of composition which he had committed. Handel listened meekly, and, at the end of the lecture, thoughtfully played his piece over again. "It sounds well," he said, at length; "I think we will not change it"; and he left the composition as it was, while the critics, later, changed the rules to fit it. Every great artist, to a certain extent, introduces innovations, which, for a time, shock the little routine men, but are accepted in the end as steps in the progress of art. To say that Mr. St. Gaudens, who is not only a great sculptor, but one of the greatest masters of low-relief since the Italian Renaissance, cannot design a good medal, because he is not a professional die-cutter, is ridiculous. In point of fact, he is, we believe, an expert and highly trained die-cutter, and his lack of routine habit frees him from just the obstacle which would stand most in the way of his producing a work of transcendent merit.

ARCHITECTS will hear with regret of the death of Mr. William Frederick Poole, the Librarian of the Newberry Library, at Chicago, and one of the most distinguished members of his profession, if, indeed, he may not be said to have been one of the principal founders of what is now a profession of great importance. His first technical work, the well-known "*Index of Periodical Literature*," was published nearly fifty years ago, and has been continually republished

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ever since, growing constantly more valuable; while the improvements in cataloguing which his active brain frequently suggested to him have been adopted all over the world. His principal claim to the attention, if not to the gratitude, of architects lies, however, in his suggestions for the improvement of library buildings. So far as the preservation and easy accessibility of books is concerned, it must be acknowledged that library buildings, as a rule, are about the worst planned structures that could be imagined, and it is not wonderful that Mr. Poole, who knew what was good for books, but knew nothing else of the requirements which library architects are called upon to fulfil, was not noted for his regard for our profession. Nevertheless, his criticisms on library architecture had no more appreciative readers than the architects, and his little pamphlet of "Suggestions" for library building probably has its place in most offices. However, even among librarians his radical notions of library design, according to which everything else was to be sacrificed to having the books accessible, as they might be, for example, in a great publisher's warehouse, did not meet with much favor, and, unless it may be his own Newberry Library, no important building of the kind has yet been designed after his notions, and it will probably be reserved for the architects whom he rated with so much energy to find means of reconciling the reforms which he advocated with the other conditions of library planning.

THE Metropolitan Museum of Art is rapidly enlarging its splendid collection of casts, which has already grown to be one of the most useful means of education ever offered to students. Architects, and students of architecture, particularly, must find the casts of sculpture an indispensable supplement to the Willard collection of architectural objects, and those who are fortunate enough to live within reach of it are to be envied. Mr. Edward Robinson, whom the architects of Boston and New York have learned to regard as a most sympathetic guide in the realms of plastic art, has from the beginning directed the choice of objects to be reproduced for the Museum, and, in the department of Mediæval and Romanesque sculpture, he has availed himself of the assistance of a professional architect, Mr. H. Langford Warren, of Boston, in making his selection.

THE Boston *Herald* calls attention to the new French law for the prevention of forest fires, and suggests that something of the same sort might be useful here. Apart from some regulations as to the punishment of persons who kindle fires in forests, which it would be impossible to apply in a wild country like ours, the law is principally to be recommended for the directions which it gives for keeping forest estates separated from each other by strips of cleared land, from sixty to a hundred and sixty feet wide, according to circumstances, on which no shrubs are to be allowed to grow. In the same way, every railroad company whose line passes through a wooded region must, at its own expense, keep a strip sixty feet wide, on each side of its location, thoroughly cleared of trees and brush. This provision could, and should, be imitated in all our States. Several railway companies already keep, by arrangement with the owners, the land for a certain distance on each side of their roadway cleared, but statutes requiring this to be done would assist the careful railway presidents in dealing with owners, besides enforcing proper precautions on the indifferent ones. Another valuable rule, which might be adopted here, is that compelling owners of forest land to keep a clear space around their property. It would be easy to enforce this rule, by making owners who neglected it liable for damages to their neighbors from fires spreading from their own ground; and it might be possible, perhaps, to require that great forest estates should be subdivided by isolating strips of cleared land. Every one knows that the most essential element of security against fire in a building is to subdivide the building as much as possible, by fire-resisting partitions; and an owner of timber land who had been compelled to clear a few strips across it would be well repaid by the knowledge that he could not lose more than a tenth or a twentieth part of his fortune by any one fire.

ARCHITECTS will remember that the old books on building advise that the trees intended to be cut for timber should have a ring of bark cut out, around the trunk, in the latter part of the winter preceding the autumn season in which they are felled. This advice seems to have been founded on experience, but, so far as we know, it is never followed in modern times. Very recently, however, M. Mer, of the great Forest School at Nancy, in answering an inquiry as to the best means for preserving wooden telegraph-poles from the ravages of insects, explains the effects of "ringing" growing trees in a very interesting manner. According to him, a tree, intended to be used for a telegraph-pole, should be cut in the autumn, and, during the preceding winter, should have a ring cut out of the bark, down to the wood, near the upper part of the trunk. If this is done, the ascent of the sap in the spring is prevented, as it is well known that the sap circulates just under the bark. The tree, nevertheless, grows, consuming, as nutriment, the starch grains laid up in the sap-wood. When the season's growth is over, the starch in the sap-wood is gone, but, as fresh sap has not been allowed to circulate, no new starch has been deposited in its place, to supply the next season's growth, and when the tree is felled, its tissues contain no starch, and, consequently, no food for the insects which feed upon wood, and which, according to M. Mer, only eat the wood for the starch that they find in it. To inject the wood with sulphate of copper, as is sometimes done, M. Mer says, helps to complete its protection, but only on condition that the starch is first removed as he suggests.

A CURIOUS controversy came before the Secretary of the Navy the other day. It is well known that our modern naval vessels are protected with plates of nickel-steel, containing three per cent of nickel to ninety-seven per cent of steel. The metal for the purpose was bought by the Government some time ago and turned over to the Carnegie Steel Company and the Bethlehem Steel Company, for conversion into armor plates. This conversion was carried out successfully, and the plates have been used for their intended purpose. In fitting the plates, however, a good deal of cutting and trimming is necessary, and a large amount of so-called "scrap," of nickel-steel, has accumulated, the accumulation amounting to about two thousand tons at the Carnegie mill, and twenty-two hundred at Bethlehem. As the nickel-steel cost the Government about five hundred dollars a ton, it is evident that the public treasury has more than two million dollars invested in these two scrap-heaps; and the Government officials think that the property is worth claiming. The rolling-mill owners, on the other hand, say that the trimmings of the plates belong to them, giving, as a reason, that the working over of these trimmings involves extra expense. It does not seem to be proved that the companies have ever been called upon to work over the nickel-steel trimmings without compensation, and, even if they should be called upon to do it later, two million dollars would pay for a good deal of the extra labor which they fear so much. As the same question, on a smaller scale, often comes up in building-matters, where contractors, entrusted with the owner's materials, appropriate everything that is left over when their work is done, it will be interesting to see how the Government case is decided.

THE Art Club of Philadelphia will hold its fourth annual exhibition of water-colors and pastels at its own galleries, from Monday, March 26, to Sunday, April 22. A gold medal will be awarded for the best work shown, and sales will be made if desired. Contributions will be received to, and including, Wednesday, March 14. Pictures in packing-cases will not be received at the Club galleries, and works so packed must be sent to some person in Philadelphia who will unpack them, and send them to the Club.

THE Department of Architecture of the Brooklyn Institute of Arts and Sciences will hold its third annual exhibition of architectural and decorative drawings at the Brooklyn Art Association Galleries, 174 Montague Street, beginning Friday evening, March 30, and ending Saturday evening, April 21. Drawings must be framed or mounted on stretchers, and will be collected and returned, free of charge, in New York, Brooklyn, Boston and Philadelphia, if due notice is given. Entries must be sent on or before March 15, to the Secretary, Dr. William H. Ingersoll, 174 Montague Street, Brooklyn, N. Y.

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THE FRENCH RENAISSANCE.[1] — IV.



Fig. 12. Saint-Martin-des-Vignes, Troyes.

IN architecture everything was directed by men of French origin and in accordance with French methods. The investigations of Champollion-Figeac and M. Léon Palustre show that it was Gilles le Breton who, from 1527 to 1552 (date of his death), constructed the major part of the buildings of the Cour Ovale, the Gallery of François I, the Gallery of Henri II, the double chapel of Saint-Saturnin, the Porte Dorée and the ground-floor of the left wing of the Cour de la Fontaine. Between 1527 and 1551, one of his *confrères*, Pierre Chambiges, erected with astonishing rapidity the structures adjoining the Cour du Cheval Blanc. In 1552, Philibert Delorme succeeded Gilles le Breton; he found the work far advanced, but, as was his wont, he did not fail to assert his own personality — to the detriment of his predecessors' productions — by making all the minor changes possible. But necessarily he was greatly fettered and it is hardly proper to count him among the architects of Fontainebleau. This title, however, rightfully belongs to Pierre Gérard, called Castoret, who completely reconstructed the façade of the Cour du Cheval Blanc between 1558 and 1561, and erected the left wing of the Cour de la Fontaine, between 1564 and 1566.

As Le Breton, Chambiges and Castoret did not figure among artists of the first rank, and as they have been almost unknown up to the present time, people were free to attribute the construction of the Palace of Fontainebleau to Italian architects. However, the expense accounts and other similar papers have been carefully and conscientiously examined in recent years and no doubt now remains that this honor belongs almost exclusively to the above-mentioned masters. Serlio, who is popularly considered as embodying the Italian influences, did not arrive until 1541, when little was left to be done; such noteworthy additions as were made after this date were not executed until after his death, which occurred in 1552. He proposed a few plans which were much praised; but none of them was carried out, a fact of which he himself complained bitterly in his memoirs, while at the same time treating Le Breton as a *muratore*, or hod-carrier; as for his advice, neither Le Breton, who had long before won the king's confidence, nor Philibert Delorme, who thought himself superior to all the other architects of his day, felt in a mood to accept it. The French masters were then free to follow the national traditions dating from the time of Louis XII and give rein to their own inclinations. But holding, as we have remarked, only a secondary rank among their fellow artists, though sufficiently powerful to resist the influence of Serlio — whose talents, moreover, were still more questionable than their own — they were not strong enough to impress themselves upon those about them; in spite of the exceptional importance of the structure, and notwithstanding the tendency of lords and courtiers to copy whatever has received the stamp of the sovereign's approval, Fontainebleau found no imitators, did not become the centre of a school, but remained an isolated, individual monument.

François I reaped more fruitful results from his importations of Italian sculptors and painters. Rosso (called in France Maître Roux), Primaticcio, Benvenuto Cellini and Nicolo dell' Abbate, to whom must be added Paul Ponce and Domenico del Barbiere, whose activity was not exclusively confined to Fontainebleau, brought from Florence or Rome statues, cameos, specimens of the goldsmith's art, casts and designs, and, as a consequence, the French taste for Roman antiquity and for the Italian Renaissance became more sharply defined; although these artists were also of secondary importance in their native land, they were, nevertheless, possessed of genuine talent and they were able to exercise it directly to its fullest extent; their productions, with the Florentine stamp predominant, were numerous and attracted the attention of their contemporaries. The influence of Fontainebleau on the decoration of the grand apartments of castles is clearly apparent; it even tended powerfully toward the abandonment of Gothic vaulting for churches, and on this ground alone it may be said that this palace had some effect upon the destinies of French architecture.

As had been the case with both the Gothic and Romanesque styles, as soon as the French Renaissance was securely and confidently established, it was divided into regional schools; but, unlike these mediæval styles, it admitted likewise of individual schools, represented either by a master or by an *atelier*.

As the French Renaissance sprang originally out of the national spirit, and as the manifestations of this spirit were untrammelled and dissimilar in the various provinces down to the time of Louis XIV, nothing was more natural than that the old territorial divisions should be maintained. Only, artistic centres were liable to shift and the number and limits of the schools were subject to change. These were not equal in individuality or merit, and their power as schools was not always in a direct ratio to the artistic perfection obtained and the importance of the edifices constructed. Ile-de-France,

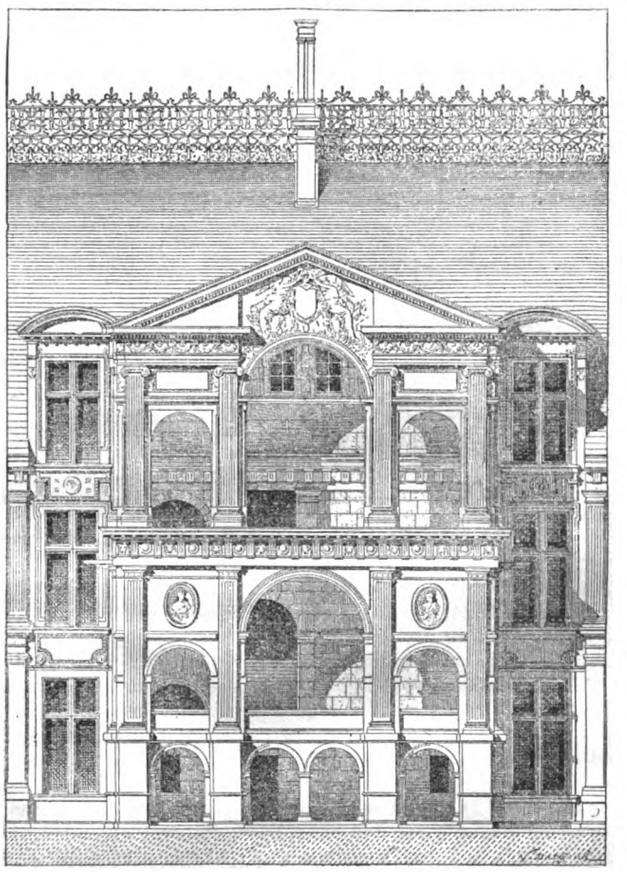


Fig. 14. Entrance to the Château of Ecouen.

which had given the tone to Pointed architecture, had ceased to exercise any suzerainty in the sixteenth century. On the other hand, Brittany, which was tributary to Normandy during the Gothic and Romanesque eras, attained to a degree

[1] From the French of Anthyme Saint-Paul, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 949, page 101.

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of originality which made it a world apart, as soon as it regained the mastery over itself, and at the very moment when it was losing political autonomy by out-and-out annexation to France (1532). The Breton monuments are imposing, full of surprises, charming in their sincerity, but composed without any regard to the *ensemble* and executed with a want of correctness, for which we may find an excuse in the quality of the granite generally used. Then follow, descending in the scale of originality, the schools of Troyes, Toulouse and Orléans, the Norman and Burgundian schools, the schools of Blésois, Touraine, Anjou, and doubtless others which at last become unrecognizable except in the very minor details.

The schools of Troyes, Orléans and Toulouse are peculiar to the three cities whose names they bear. They are not regional schools; but they are deserving of a passing notice, for their merits appear to be in an inverse ratio to their comparatively restricted limits. Moreover, each member of this little privileged group has its individual characteristics, separating it sharply from the other two. The school of Troyes is a school of religious architecture which originated

beautiful windows with coupled, or twin, arches that seem to have been more common there under François I. At Toulouse, the characteristic features are found in the mansions of municipal or parliamentary magistrates — two Toulousan types, however, occur outside of this class of structures, namely, the door of the Church of La Dalbade and the small cloister of the Augustins (Fig. 13); these fine residences have superimposed stories of arcades, either open or filled-in, on the courts, and windows framed with a certain wealth of curved mouldings, pediments, casings and *gaine*-shaped caryatides. Dijon, Fontenay-le-Comte, La Rochelle and Riom may possibly be considered as having been in a very small way seats of other local schools; the architecture of Dijon, which already belonged to a provincial school, would thus have a double origin, of which unfortunately no adequate idea could be given here without entering into a long and complicated discussion.

In all provincial schools, the more pronounced and overmastering the traditions and habits the less could the peculiar genius of an artist show itself; for this reason, the school which was weakest as a school, that of Ile-de-France, was most

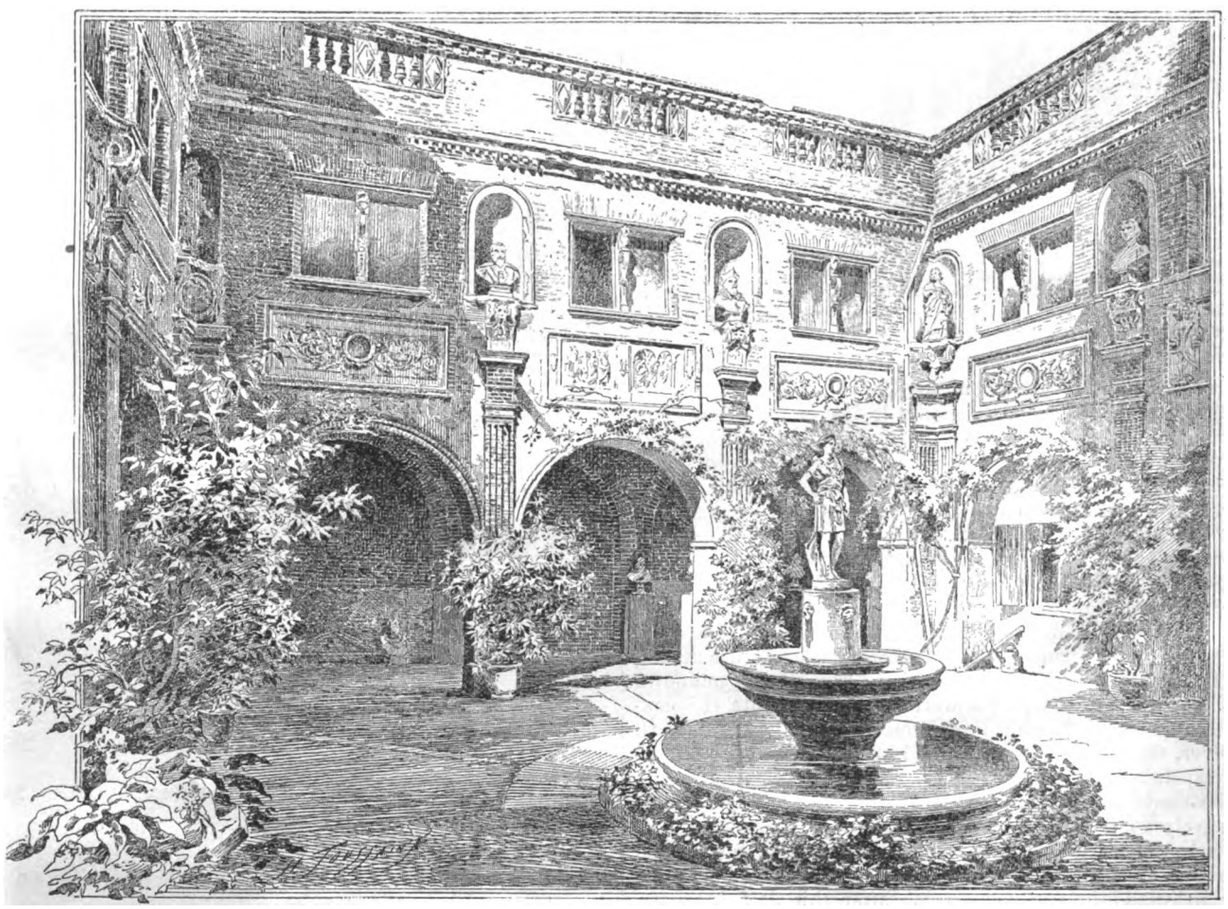


Fig. 13. Small Cloister of the Augustins, Toulouse.

in, or rather which was developed after, a conflagration that destroyed, in 1524, the greater part of the city and necessitated the construction or restoration of about ten churches.

All of the existing churches of Troyes either belong wholly to the Renaissance or have some of their important parts in this style, characterized by ingenious applications of ancient types to the portals, by the perpetuation of the pointed arch for the windows and by the spandrel or tracery, the motives of which are borrowed less from Pointed art than from Greco-Roman (Fig. 12). The school of Troyes was especially strong in ornamental sculpture and bas-reliefs; its sway extended five or six leagues, at least, from its centre; like Brittany, this part of Champagne, in the luxuriousness of its portals, of its tabernacles, altars and divers other devotional accessories, furnishes delightful fields for the intelligent amateur, and here he will find correctness in addition to other qualities. The Orléans school distinguished itself by its houses with the gable end toward the street, in which the doors and windows are treated with a spirit that defies all classification, aside from the

favorable to the display of individual power. The school of Ile-de-France was, in reality, superseded by a sort of vagrant, nomadic school, following the king from one residence to another, and subject to the passing influence of any talent which the protection of the monarch or of a powerful courtier might bring to light. The "official" architects were at that time the ones who possessed in the highest degree a "manner" of their own, either in their creations, combinations or choice of motives, which to a trained observer serves as a signature — the exact reverse of the situation to-day. Pierre Chambiges distinguished himself at Saint-Germain and Fontainebleau by the use of brick in the buttresses, angles and window-framings, and stone for the mass of the masonry, thus interchanging the rôles usually assigned to these two materials. Jean Bullant, immortalized by Écouen, the *petit château* of Chantilly, Fère-en-Tardenois and possibly Monceaux, introduced the colossal order into his works, though with adaptations peculiar to himself; he begins and ends the column so that it overlaps the ground-floor and first-story and cuts the frieze or moulding

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indicating the intermediary ceiling, and so that the entablature is, in its turn, cut by the upper window (Fig. 14). There was but little temptation to follow this arrangement, which was odd rather than graceful, and the monopoly of it was left to its author. His signature could not, therefore, have furnished a stronger proof of the authenticity of his work. Philibert Delorme, the architect of the Tuileries and the Château d'Anet, came forward with his "French order" — spacious doors with semicircular arches, with framings of pilasters and an imposing pediment, and sometimes opening in a semicircular recess, as at the Church of Saint-Nizier at Lyons. The Le Bretons exhibited an individual style at Fontainebleau and Villers-Cotterets; but, at Fontainebleau, at least, it was rather barren. In Saint-Eustache at Paris, Pierre Lemercier — if he was indeed the architect of the church — has bequeathed to us a structure without a forerunner as it has remained without a follower; in its presence the student asks himself whether it was a challenge sent by Pointed art to the Renaissance or by the Renaissance to Pointed art. The three provincial schools of the Loire are, perhaps, merely the outgrowth of the teachings and practices of two schools of architects, one represented at Orléans (hôtel de ville), Beaugency (hôtel de ville), Blois (François I wing) and Chambord, by Viart, the Sourdeaus and Pierre Trinqueau, called Nepveu; the other represented in Anjou and to a certain extent, we are assured, in Berry (Valençay) by Jean de Lespine. In Normandy, Hector Sohier secured a rich field for himself; the finest production of his labors is the apse of St. Peter's at Caen, a work that has been so often reproduced in engravings and paintings during the past century that it would seem commonplace, if that were possible with such a creation. Though Sohier was not the originator of ceilings on ribs, he it was who made the finest application of them in apsidal chapels. On the exterior of his churches he employed the semicircular arch for the windows and for the candelabrum-like pinnacles, which he transferred to civil constructions and which enable us to recognize his hand or the hand of some one of his disciples in the Château de Lasson. His ornamentation is lavish, but in this respect he merely conforms to the notions of the Norman school, one of the distinctive characteristics of which is exuberance in decoration.

(To be continued.)

FIRE-RESISTING GLASS. — Glass having unusual fire-resisting properties has recently been produced in Germany; and competitive tests have been held to ascertain the merits of samples from several factories. The glass was put into the vertical windows and skylights of an old building, which was then set on fire; and sudden changes of temperature, shocks from weights and jets of water and other means were employed to prove its toughness. Excellent results were attained, especially by the glass from the Siemens works in Dresden, which withstood a temperature of 2140° Fahrenheit for half an hour. — *N. Y. Tribune.* It should be added that the material experimented with was wire-glass. — EDS.

A PROPOSED FORMULA FOR WHITE PINE POSTS.

An article by the present writer, entitled "A Proposed new Formula for Yellow Pine Posts," appeared in the *American Architect* of April 9, 1892. It was a straight-line formula of the form

$$S = 4{,}250 - 43\tfrac{1}{3}\,\frac{l}{d}$$

representing the average of the lowest breaking values of a series of tests, made on *full-size* sticks at the Watertown Arsenal. The working formula

$$s = 1{,}000 - 10\,\frac{l}{d}$$

was recommended,

s = allowable stress per square inch.
l = length of piece in inches.
d = smaller diameter in inches.

assuming the factor-of-safety of $4\frac{1}{4}$, approximate.

The object of the present article is to bring to notice a similar formula for *White Pine Posts.* As in the former case, the tests were made at the Watertown Arsenal on *full-size* sticks and each test has been plotted with the breaking-load in pounds per square inch for the ordinate and the ratio of l to d for the abcissa, as shown in the cut. An average line for the lowest breaking-loads in each set of tests has been drawn whose equation is

$$S = 3{,}150 - 40\,\frac{l}{d}.$$

Using the factor-of-safety of 4, we may write

$$s = 800 - 10\,\frac{l}{d}.$$

Of course, any other factor-of-safety may be used, and, if the formula of the style

$$S = \frac{K}{1 + \frac{1}{k}\,\frac{l^2}{d^2}}$$

is preferred, we may use for breaking loads

$$S = \frac{3{,}200}{1 + \frac{1}{1{,}200}\,\frac{l^2}{d^2}}$$

which gives very nearly the same results as the simpler form above.

Considerable search has been made for tests on *full-size* posts of *oak* and *spruce*, but without success. Judging from the tests on small-size specimens made at Watertown Arsenal for the Tenth Census[1], and also from the results of tests on large-size beams[2] made by Professor Lanza and noted in his "*Applied Mechanics*," we may assume, in the absence of other information, that yellow pine and white oak have about the same value and that white pine and spruce also are nearly equal in strength, as posts.

The following is recommended for the allowable stresses per square inch:

$$\left.\begin{matrix}\text{Yellow pine}\\ \text{or white oak}\end{matrix}\right\} s = 1{,}000 - 10\,\frac{l}{d}$$

with a factor-of-safety of $4\frac{1}{4}$

$$\left.\begin{matrix}\text{White pine}\\ \text{or spruce}\end{matrix}\right\} s = 800 - 10\,\frac{l}{d}$$

with a factor-of-safety of 4. [It may be noted that, from the above formulas, white pine and spruce are worth about 20 per cent less than yellow pine and spruce.]

The tables herewith have been computed from the above formulas

	Yellow pine.	White oak.	White pine.	Spruce.
[1] Av. value of tests in lbs. per sq. in.	7,000	7,100	5,000	4,900
[2] " " " " " " " " " "	7,300	6,100	4,800	4,900

Safe Loads, in Pounds, for Yellow Pine Struts.

Computed from the formula 1000 − 10 l/d. l = length in inches d = smaller diameter in inches. This is approximately the same with a factor of safety of 4¼, as the Formula 4250 − 43.3 l/d, which was obtained by plotting all experiments obtainable, on full-sized sticks, made with the Government Testing Machine at Watertown Arsenal and represents the average of all the lowest breaking weights in each set of tests.

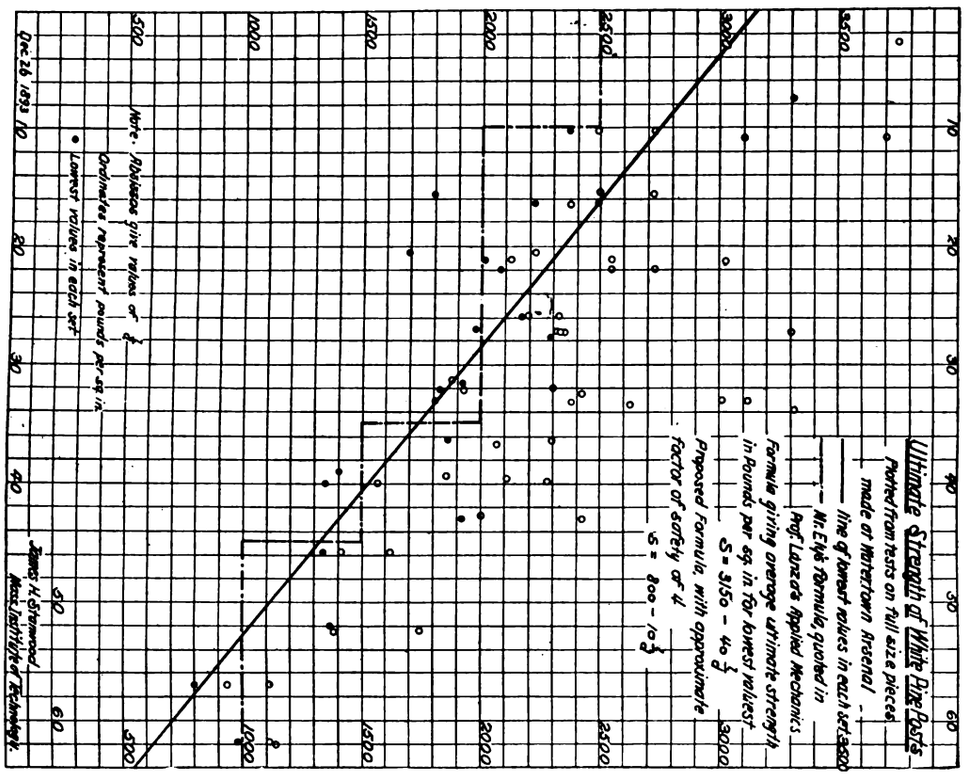
J.H. Stanwood, Mass. Institute of Technology, 1891.

Size	6 Ft.	8 Ft.	10 Ft.	12 Ft.	14 Ft.	16 Ft.	18 Ft.	20 Ft.
4×4	13 100	12 200	11 200					
4×6	19 700	18 200	16 800					
4×8	26 200	24 300	22 400					
4×10	32 800	30 400	28 000					
4×12	39 400	36 500	33 600					
6×6	31 800	30 200	28 800	27 400	25 900	24 500		
6×8	42 300	40 300	38 400	36 500	34 600	32 600		
6×10	52 800	50 400	48 000	45 600	43 200	40 800		
6×12	63 400	60 500	57 600	54 700	51 800	49 800		
6×14	74 000	70 600	67 200	63 800	60 500	57 100		
6×16	84 500	80 600	76 800	73 000	69 100	65 300		
8×8	58 200	56 300	54 400	52 500	50 600	48 600	46 700	44 800
8×10	72 800	70 400	68 000	65 600	63 200	60 800	58 400	56 000
8×12	87 400	84 500	81 600	78 700	75 800	73 000	70 100	67 200
8×14	101 900	98 600	95 200	91 800	88 500	85 100	81 800	78 400
8×16	116 500	112 600	108 800	105 000	101 100	97 300	93 400	89 600
8×18	131 000	126 700	122 400	118 100	113 800	109 400	105 100	100 800
10×10	92 800	90 400	88 000	85 600	83 200	80 800	78 400	76 000
10×12	111 400	108 500	105 600	102 700	99 800	97 000	94 100	91 200
10×14	129 900	126 600	123 200	119 800	116 500	113 100	109 800	106 400
10×16	148 500	144 600	140 800	137 000	133 100	129 300	125 400	121 600
10×18	167 000	162 700	158 400	154 100	149 800	145 400	141 100	136 800
12×12	135 400	132 500	129 600	126 700	123 800	121 000	118 100	115 200
12×14	157 900	154 600	151 200	147 800	144 500	141 100	137 800	134 400
12×16	180 500	176 600	172 800	169 000	165 100	161 300	157 400	153 600
12×18	203 000	198 700	194 400	190 100	185 800	181 400	177 100	172 800
14×14	185 900	182 600	179 200	175 800	172 500	169 100	165 800	162 400
14×16	212 500	208 600	204 800	200 900	197 100	193 300	189 400	185 600
14×18	239 000	234 700	230 400	226 100	221 800	217 400	213 100	208 800
16×16	244 500	240 600	236 800	233 000	229 100	225 300	221 400	217 600
16×18	275 000	270 700	266 400	262 100	257 800	253 400	249 100	244 800
18×18	311 000	306 700	302 400	298 100	293 800	289 400	285 100	280 800
	6 Ft.	8 Ft.	10 Ft.	12 Ft.	14 Ft.	16 Ft.	18 Ft.	20 Ft.

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and may be found useful for reference. The table of Yellow Pine Posts is reprinted from the earlier article.

James H. Stanwood, S. B.,
Instructor in Civil Engineering, Mass. Institute of Technology.
December 26, 1893.



Safe Loads, in Pounds, for White Pine Struts.

Computed from the Formula.. 800 - 10 l/d, l = length in inches, d = smaller diameter in inches. This formula was obtained by plotting all experiments on full size pieces made at Watertown Arsenal and represents the average of all the lowest breaking weights in each set of tests.

James H. Stanwood,
Mass. Institute of Technology.

Size	6 Ft.	8 Ft.	10 Ft.	12 Ft.	14 Ft.	16 Ft.	18 Ft.	20 Ft.
4x4	9 900	9 000	8 000					
4x6	14 900	13 400	12 000					
4x8	19 800	17 900	16 000					
4x10	24 800	22 400	20 000					
4x12	29 800	26 900	24 000					
6x6	24 500	23 000	21 600	20 200	18 700	17 300		
6x8	32 600	30 700	28 800	26 900	25 100	23 000		
6x10	40 800	38 400	36 000	33 600	31 100	28 800		
6x12	49 000	46 100	43 200	40 300	37 400	34 500		
8x4	57 100	53 800	50 400	47 000	43 700	40 300		
6x6	65 300	61 400	57 600	53 800	49 900	46 100		
8x8	45 400	43 500	41 600	39 700	37 800	35 800	33 900	32 000
8x10	56 800	54 400	52 000	49 600	47 200	44 800	42 400	40 000
8x12	68 200	65 300	62 400	59 500	56 600	53 800	50 900	48 000
8x14	79 500	76 200	72 800	69 400	66 100	62 700	59 400	56 000
8x16	90 800	87 000	83 200	79 400	75 600	71 700	67 800	64 000
8x18	102 200	97 900	93 600	89 300	85 000	80 600	76 300	72 000
10x8	72 800	70 400	68 000	65 600	63 200	60 800	58 400	56 000
10x10	87 400	84 500	81 600	78 700	75 800	73 000	70 100	67 200
10x12	101 900	98 600	95 200	91 800	88 500	85 100	81 800	78 400
10x14	116 500	112 600	108 800	105 000	101 100	97 300	93 400	89 600
10x16	131 000	126 700	122 400	118 100	113 800	109 400	105 100	100 800
12x12	106 600	103 700	100 800	97 900	95 000	92 200	89 300	86 400
12x14	124 300	120 900	117 600	114 200	110 900	107 500	104 200	100 800
12x16	142 100	138 200	134 400	130 600	126 700	122 900	119 000	115 200
12x18	159 800	155 500	151 200	146 900	142 600	138 200	133 900	129 600
14x14	146 700	143 400	140 000	136 600	133 300	129 900	126 600	123 200
14x16	167 700	163 700	160 000	156 100	152 300	148 500	144 600	140 800
14x18	188 600	184 300	180 000	175 700	171 400	167 000	162 700	158 400
16x16	193 300	189 400	185 600	181 800	177 900	174 100	170 200	166 400
16x18	217 400	213 100	208 800	204 500	200 200	195 800	191 500	187 200
18x18	246 200	241 900	237 600	233 300	229 000	224 600	220 300	216 000

Mr. Robbins gives rules of 1/2
Ordinates represent pounds per sq. in.
Lowest values in each set.
James H. Stanwood
Mass. Institute of Technology.

ARTIFICIAL REFRIGERATION THROUGH STREET PIPE-LINES FROM CENTRAL STATIONS.[1]

A POPULAR idea prevails that we furnish cold air. As a matter of fact we do not send out cold air, or anything cold, through our pipes. All such methods have been, and must be, financial failures, in spite of the most costly insulation, because of the percentage of loss of cooling power through absorption of heat from the earth or air through which the pipes pass.

Correctly speaking, our business is not to furnish anything; but to remove from the premises of our customers two things of which they wish to be rid — heat and humidity.

The most suitable material, as well as by far the cheapest, which can safely be used as a heat extractor, is ammonia. It conveys heat to the central station, where the heat is disposed of through an application of cold water; and the water, after being thus loaded with heat, is ordinarily discharged into the sewer.

To make the illustration more clear to those having no knowledge of ice-making or refrigerating machines, it might be well to explain by saying that expanding ammonia absorbs heat and that water absorbs ammonia, just as a sponge absorbs water. One might say

[1] A paper read by Mr. David Branson before the Franklin Institute and printed in the *Journal* of the Society.

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that water is a sponge for ammonia, and ammonia is a sponge to sop up heat.

Since the first practical development of artificial refrigeration and its application to the cooling of breweries and packing-houses, and to ice making, it has been the dream of many inventors, and also the aim of industrial promoters, to achieve a practical, safe and economical method of distributing refrigeration. Some twenty or more costly efforts to accomplish this result had been made in a dozen different cities, including Paris, London, New York, Boston, Louisville and Nashville. These resulted either in failure or in only partial success, but there was a great gain of valuable knowledge of the difficulties to be overcome with little knowledge of how to overcome them, until five years ago, when Messrs. Starr, Thornburgh & Branson, the inventors of the system which we are to discuss



Madison Square Garden, New York, N. Y. Sketched by Claude Fayette Bragdon.

this evening, undertook to study the causes of the failures of their predecessors.

Fortifying themselves with all the data that could be obtained, they experimented extensively, and visited many of the wrecks of other experiments.

The result has been a series of inventions which have been put into practical operation on a commercial scale in the cities of Denver and St. Louis. The plant in Denver was started on the eighth of August, four years ago, and has not been obliged to stop a single day since, though it has been twice enlarged and the street line extended. The street line in St. Louis has also been operated for more than three years. Both plants give such satisfaction to their patrons that many would not return to the use of natural ice could they procure it for nothing. . . .

At the outset of our attempt to construct and operate our street pipe-line system, we found that the principal obstacles were:

(1) The loss of power by absorption of heat from the earth.

(2) The difficulty of handling the constantly changing refrigerating-load.

(3) The occasional stoppage of service of an entire district by reason of fire or breaks in the line, through accident, or the necessity of making new connections.

(4) The automatic regulation of temperature.

(5) The leakage of the volatile material used as a refrigerating agent.

The absorption of heat from the earth is avoided by what is known as a direct-expansion system, in which the liquid anhydrous-ammonia (usually at a pressure of 150 pounds to the square inch at summer temperature) flows from the machine through one pipe (the liquid-line) to the point of use, and is there expanded by being allowed to flow through a small hole, in a carefully-adjusted valve, capable of being regulated to suit the amount of refrigeration required. This expansion takes place in a coil of pipe, within the space required to be cooled, which pipe is known as the expansion-coil; and from this coil the anhydrous-ammonia, now changed to a vapor, returns through a larger pipe (the vapor-line) to the central station. By this system, the entire cooling-power of the machine is delivered and utilized in the refrigerators of the customers, none being lost on the way. The pipes, with the exception of the expansion-coil, remain at the temperature of the ground or air through which they pass.

Our predecessors had managed fairly well to provide regular temperatures in large establishments under the changing conditions of the seasons, or of day and night, by increasing or lessening the number of machines in operation or the speed at which a single machine was operated. But this had its limitations, both financial and mechanical.

In the street pipe-line business this difficulty is increased tenfold. Experience soon taught us that no possible calculation could enable

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us to predict when the demand upon the machine would suddenly rise tenfold, without a moment's warning, or as quickly fall to practically nothing.

To provide against this difficulty, we introduced one reservoir (for liquid anhydrous-ammonia) at the outgoing end of the machine, a second reservoir (for strong aqua-ammonia) at the incoming side of the machine, and a third (for weak aqua-ammonia), which is usually placed at a higher elevation.

When the strong aqua-ammonia reservoir is full, both the others are empty, as their contents are supplied by the separation of the ammonia, or the greater part of it, from the water originally holding it in the strong aqua-ammonia reservoir. The contents of this reservoir are pumped into the still at a uniform rate, and from the still the pure ammonia passes through the condensing-coils to the reservoir for liquid anhydrous-ammonia and the water or weak ammonia remaining flows to its reservoir above, each impelled by the pressure obtained from the heat of the distilling process.

The contents of the weak-ammonia reservoir flow by gravity to the absorber automatically, as required, and absorb the returning anhydrous-ammonia vapor from the street-line.

As we use what is known as an absorption-machine (because compression-machines have been found impracticable for this purpose), the anhydrous-ammonia vapor returning from the line is first discharged into a tank of peculiar construction, called an absorber, where it is reunited with the weak aqua-ammonia from which it was originally driven by distillation. When this aqua-ammonia has absorbed all of the anhydrous-ammonia vapor that it is capable of holding, it is automatically discharged into the reservoir for strong aqua-ammonia, from which it is again pumped into what is known as the still or separator.

By this reservoir system several objects are accomplished; first, a machine of half the size that would otherwise be needed will answer for any required amount of service; as it will readily be seen that without the reservoir, a machine would have to be of sufficient capacity to perform the service called for during the hottest hour of the hottest day, while during other hours a machine of one-tenth the capacity would often be ample.

In the reservoir system, the machine operates steadily throughout the twenty-four hours, while the reservoirs vary in the amount of their contents alternately, as the demand reaches a rate greater or less than the average of the machine.

This system also enables us to shut off the machine entirely for short periods to make repairs and in cold weather, to dispense with a night force entirely, allowing the reservoir and the absorber to work automatically, without attention.

Of course, in very large cities, multiples of the largest-sized machine would be used with reservoirs of sufficient size to give steadiness to the operation of either machine and to permit of short stoppages.

Our third great difficulty was overcome by providing a vacuum or safety line, which is a vital part of the system; for, without it, continuous operation could not be secured, nor could necessary repairs be made. This vacuum-line is a third pipe connected with the liquid and vapor pipes, at or near their entrance to each refrigerating-box supplied, and also in the man-holes at the street-crossings.

In case of necessary repairs, alterations or additions to the pipes in any premises, the stop-cocks on the liquid and vapor pipes are closed, and the cock on the vacuum-line (which has been habitually kept closed) is opened; the vacuum-pump is then started at the station, and thus the ammonia contained in the expansion-coil is drawn back to the central station and a ten or fifteen inch vacuum is also usually produced. Then the piping in the refrigerating-box may be opened without any smell of ammonia escaping.

By the same method, any section of the main line may be cut into for additional connections or repairs, by means of opening and closing cocks in the man-holes at street-crossings.

In our later work we have made the vacuum-line of such size that it can be used as a temporary substitute for either the liquid or vapor line, during alterations, thereby enabling us to avoid cessation of service to any customer even for an hour.

By keeping a constant vacuum, the contents of any expansion-coil or any section of the line may, without previous notice to the engineer, be promptly switched into the vacuum-line from any place where trouble has occurred, especially in case of fire or break in the street, and thus the material liable to be lost is quickly saved, as the engineer at the works will immediately start the vacuum-pump, upon his attention being called thereto by an electric-bell rung by the movement of the hand on the dial of the vacuum-gauge.

The advantages of this vacuum-line are also very apparent when it becomes necessary to shut off a customer, and pump home the contents of his expansion-coil, and leave him out in the hot for non-payment of his bill.

In the matter of automatic control we had to solve the problem of supplying all degrees of temperature, not only on the same branch line or street, but often three or four in one building, or even in the different compartments of one refrigerating-box; varying from ice-making and fish-freezing, up to the very easy task of keeping rooms for furs and woollen-goods free from moths, or taking a few degrees of heat and humidity from a restaurant dining room, a public hall, business office or hospital.

To do this, numerous devices were invented and tested — nearly all with brilliant success at the start; only to be followed by dismal failure when put to the test of time and innumerable changing conditions.

They choked up, froze up, gummed up and broke up in every imaginable way. But, one by one, the weak points were weeded out, the strong features combined; until, finally, two forms of regulators were constructed, both of which have stood the test of every possible condition we could think of through the changing requirements of spring, summer, autumn and winter.

These automatic valves are operated by electric power supplied from a dynamo through a storage-battery at the central station; thence through an insulated copper-wire circuit laid in the same conduit which contains the pipe-line, and they are caused to open and close by the action of an ordinary thermostat placed in the cooling-box and easily adjusted by thumb-screws to any required temperature. We ordinarily set them to open the valves at one degree above, and close them at one degree below, the average temperature required; though, with careful manipulation, they can be adjusted so as to permit of much less variation. In the preservation of eggs, for instance, we do not permit a variation of more than one-half of one degree; and, as a consequence, have had a remarkable success in the preservation of this most perishable product.

In connection with the automatic-valve the electric circuit can be used to signal from any refrigerator on the line to the engineer at the station; and one form of valve is so constructed that, if it should get out of order, an electric-bell would ring in the engine-room until the valve is attended to.

The most obstinate difficulty in mechanical refrigeration was the leakage of ammonia or other volatile gas used as a refrigerating agent; but constant experiment finally evolved a series of fittings and packings for joints which have been found practically perfect under continuous use for more than two years; both under and above ground, in wet places and in dry, in heat and in cold; and after being subjected purposely to all kinds of abuse.

Provision is made in their construction for contraction and expansion of long and straight lines of piping; even when, through carelessness, there might be a sudden change of temperature of over 100 degrees.

The question of measurement of the amount of service rendered has been solved in two ways:

First, by a meter, measuring the quantity of liquid-ammonia passing into each expansion-coil. Knowing, as we do, the heat-extracting power of a pound of ammonia expanded under any given condition, it is a simple matter to calculate the equivalent, in ice-melting, of the service rendered.

The second method of estimating the amount used is the measurement of the square feet of the interior surface of the refrigerating box or room, and the figuring out of the amount of heat removed therefrom, by the aid of a set of tables carefully prepared by means of a long series of experiments with every known form of insulation now in general use for refrigerating-boxes.

The entire cost of street-line construction varies from $9,000 to $22,000 per mile, depending upon the character of the street-paving which has to be removed and replaced, the kind of soil to be excavated, the crowded or free condition of the ground under the streets from other piping, etc., the correctness of the city records as to old work in the same, and the amount of street-traffic interfering with operations. The highest cost has been in narrow, crowded business streets in St. Louis, Mo., where the paving is very expensive, and where there was a net-work of both old and new pipes, of many of which no correct record existed in the city archives. This frequently necessitated the changing of plans after the streets had been opened. In a city with pavements of average character, the cost, including branches to the sidewalk, ready-for-service connections to the number of 100 to the mile, will be about $18,000 in business neighborhoods, and about $14,000 in residence districts where the lines can generally be run through back streets containing no other pipes.

We have, so far, charged prices varying from ten to twenty per cent less than would be paid for ice sufficient to furnish an equivalent amount of cooling. In addition to that saving in their ice-bills, customers have avoided slop, wear and tear, and have saved the cost of labor in handling ice. We also give them much more uniform service, and in many cases do work which it is impossible to do with ice; especially continuous and hard freezing and furnishing dry cold where damp cooling with ice would be ruinous.

BOOKS AND PAPERS

THE Librairie de L'Art of Paris has lately issued a handy and inexpensive series of booklets, bearing the general title of "*Bibliothèque d'Education Artistique.*"[1] They comprise "*Alphabets*" by Theodore de Bry, Jean Daniel Preisler, François Emile Ehrmann and Habert-Dys, also some Italian ones of the fifteenth and sixteenth centuries from manuscripts at Siena and Ferrara. The series further includes "*Motifs Decoratifs*" from the designs of

[1] "*Alphabets; Motifs Decoratifs; Bibliothèque d'Education Artistique.*" Paris: Librairie de L'Art.

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the eighteenth-century artists, Augustin de Saint-Aubin and Jean Jacques François Le Barbier and a number of decorative fantasies by Habert-Dys. This designer, well known from his work in "*L'Art*," is stated in a prefatory note to have been the pupil of Gerôme and Bracquemond, but apparently owes much more to a careful study of Japanese art, coupled with a retentive memory, than to either of the great artists named.

THE animal-painters of our time — and more especially those who are of the French school — are fairly represented in the collection of praiseworthy reproductions from their works issued by the Librairie de L'Art under the title of "*Animaliers Contemporains*."[1] The two *recueils* of which it consists enclose copies of paintings by many eminent men in this domain of art — cattle by Mark Fisher and Vuillefroy; sheep by Schenck and Jacque; cats by Lambert; camels by Guillaumet; lions by Lançon; dogs by Henri Regnault and a fine picture of stags preparing to fight, by the veteran animal-painter Karl Bodmer, lately dead. The inadequate presentation of the horse is probably due, not to lack of appreciation, but to the fact that the publisher failed to find at hand the necessary cuts with which to do him justice, for we imagine all the blocks here printed have seen service before. But many of them are so good as to merit warm commendation.

"*Sculpteurs Contemporains*"[2] comes as another welcome addition to this series of copies of modern art-works, appropriately classified by subjects and schools. The noble art whose chiefest charm is form, is here admirably shown in numerous fine drawings, some by the sculptors themselves, others by draughtsmen like John Watkins and Bichard, whose able pens have done so much to bring works, otherwise inaccessible to most, before the eyes of the people. In this day of facile "direct" photographic copies, whose many merits we heartily acknowledge, it is refreshing to see such virile and thoroughly artistic drawings as these after the originals of other men. The collection embraces, among other good things, a superb drawing by Dalou from his "*Paysanne en Prière*."

CONSTANT TROYON[3] — a master, some of whose finest works hang on the walls of American houses — is one of the painters recently considered in the "*Les Artistes Célèbres*" series. M. Hustin is responsible for the text of the book, which carries a picture on about every other page — pictures, by the way, not as well printed as those in former volumes of the series. That which comes first is Mr. Cornelius Vanderbilt's picture of the peasant driving cows and sheep, which was in the loan collection at the World's Fair. One may believe, perhaps, that out of the hundreds of thousands of Americans who saw it there, some rough drover or Texan "cow-puncher" may have been touched by the piteous appeal of the beast which lifts its head to heaven in dumb protest against the cruel peasant's stick — a protest not without point in the great city of the stock-yards. M. Hustin tells of the youth and early efforts of the artist, of his studies and travels, his teachers and his friends, his successes and his death. The book, the first written on Troyon, has the useful lists of sales and prices which enhance the value of the series, to which it adds another volume of worth.

THE biography of Bernard Van Orley,[4] which M. Alphonse Wauters has written for the same series, is that of an artist whose fame during his life was very great, but gradually dwindled until the story of his days and deeds was all but forgotten. It is only in our own time that careful research has brought again to light the facts of Van Orley's career. Born in Brussels at the end of the fifteenth century, he studied under his father and being sent to Italy, to complete his art-education, came home deeply influenced by the great works he had there seen and admired. The pupil of Raphael, the friend of Dürer and the favored painter of Margaret of Austria, Van Orley made of his native city "a western Rome in matters of design," and dying at about fifty years of age left behind many well-esteemed works. Among them are some good portraits and a number of paintings of religious subjects, the latter including his greatest achievement, "The Trials of the Patience of Job," a commission from his noble patroness. Of much importance, too, were Van Orley's designs for tapestry and stained-glass. It is interesting to note, in many of the illustrations of M. Wauters's book, the elaborate details of the architectural surroundings in the artist's pictures, which often show a mingling of the mediæval and Renaissance styles. Van Orley evidently delighted in the delineation of costly marbles and of sculptured surfaces, of rich stuffs and of armor cunningly chased and gilded.

THE grace and spirit of that admirable and prolific designer known as Moreau le Jeune are most satisfactorily set forth in the profuse illustrations of M. Adrien Moureau's monograph on "*Les Moreau*,"[5] lately published as one of the "*Les Artistes Célèbres*" series. So far as the rest of the Moreau family are concerned, it is with the "young" artist of that name a case of "Eclipse first and the rest nowhere," as the achievements of his artist-relatives are of but little value or interest. The illustrator of Voltaire and Rousseau, and of many another author, from Ovid to Lafontaine, Moreau produced over two thousand drawings and enjoyed the favor of royalty, yet towards the end of his life became poor and shortly before his death, in 1814, was compelled, at the age of seventy-three, to ask aid of the publisher Renouard. It certainly seems fitting, however, that a member of that guild should extend a helping-hand to the suffering artist when one thinks of the money they must have realized from the labors of his accomplished hand. Well chosen examples of his skill, from a tiny vignette to the splendid drawing of the "Assembly of Notables," with its scores of courtiers sitting in the stately hall, adorn the pages of this volume, which well attest the exceptional talent of Moreau le Jeune.

M. ROCHEBLAVE has added to the series of "*Les Artistes Célèbres*" a volume of greater bulk than the average, concerning "*Les Cochin*,"[6] illustrated with 142 engravings, of which eleven are printed *en sanguine*. Excellently chosen and well-made as these are, we cannot avoid, even at the risk of displaying some ingratitude for the feast thus bountifully spread, charging the editor of this series with lacking a sense of due proportion in giving so many illustrations to this work, when, in former issues, Rembrandt was allotted but forty-one and Velazquez thirty-four. And even less excusable was it to embellish the volume which treated of the Huets, a not too well-known family of animal painters, with the largest number of illustrations (177) so far contained in any issue of the series. All this, though, does not detract from the interest of "*Les Cochin*," by far the greater part of which is rightly filled with the work of Charles Nicolas Cochin the younger, the ablest artist of the family and one of singular merit, both as designer and engraver. Here are reproduced ball-tickets, initial-letters, frontispieces, headpieces, title-pages and business cards; here are illustrations, allegories and representations of grand functions, such as the masterly drawing of the King's gaming-tables in the great gallery at Versailles, on the occasion of the marriage of the Dauphin, in 1745. And, lastly, there are the fine portraits — portraits of Boucher and Chardin, of Garrick, of Mdlle. Clairon, and of Madame Favart, among the many other choice ones whose features were faithfully fixed by the pencil of Cochin.

SOCIETIES

THE SKETCH CLUB OF NEW YORK.

THE regular monthly meeting and dinner of the Club was held at the club-rooms, Saturday, March 3, about fifty members being present. Some very good drawings were handed in for the Village Church and Mausoleum competitions. Mr. Albert E. Parfitt, who was a guest of the Club, gave a very interesting talk, accompanied by stereopticon views of a trip through Italy, France, Germany and England, as these countries appeared in the fifteenth century. Mr. Parfitt's lecture was very much appreciated. Next, we had an echo of the World's Fair, through the kindness of Mr. J. J. Petitt who introduced some Midway Plaisance novelties. The Club enjoyed this bit of refined entertainment hugely.

H. C. PITTMAN, *Recording Secretary.*

AMERICAN INSTITUTE OF ARCHITECTS, NEW YORK, N. Y.

AT the annual meeting of the Board of Directors of the American Institute of Architects, held in New York, on February 8, we, the undersigned, were appointed a committee of three, to report to the Board of Directors before the next annual convention suggestions embodying rules to govern competitions. We were also requested to make this statement to the different professional journals — inviting architects to submit suggestions for our consideration.

(Signed) GEORGE B. POST.
JAMES W. MCLAUGHLIN.
THOMAS HASTINGS.

T-SQUARE CLUB OF PHILADELPHIA.

A MEETING of the T-Square Club was held at the club-rooms, Wednesday evening, February 21. The subject for competition was "A Memorial Column to commemorate a Battle." There were ten designs submitted. First mention was awarded to Wm. C. Hays; second mention to Robert C. Heath and third mention to Edw. T. Boggs.

The competition for the March meeting was announced: "A Scheme in Color-decoration for a Hall in a Country House."

GEORGE BISPHAM PAGE, *Sec'y.*

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[1] "*Animaliers Contemporains.*" Paris: Librairie de L'Art.
[2] "*Sculpteurs Contemporains.*" Paris: Librairie de L'Art.
[3] "*Constant Troyon*," par A. Hustin. Paris: Librairie de L'Art.
[4] "*Bernard Van Orley*," par Alphonse Wauters. Paris: Librairie de L'Art.
[5] "*Les Moreau*," par Adrien Moureau. Paris: Librairie de L'Art.
[6] "*Les Cochin*" par S. Rocheblave. Paris: Librairie de L'Art.

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ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

CHAMBER CEILING DECORATIONS IN THE HOUSE OF WILLIAM ROCKEFELLER, ESQ., TARRYTOWN, N. Y. MR. H. T. SCHLADERMUNDTT, DECORATOR, NEW YORK, N. Y.

[Gelatine Print issued with the International and Imperial Editions only.]

DESIGN FOR THE FIRST CONGREGATIONAL CHURCH, PLYMOUTH, MASS. MESSRS. CRAM, WENTWORTH & GOODHUE, ARCHITECTS, BOSTON, MASS.

MORTON STREET PRIMARY SCHOOL, BOSTON, MASS. MR. E. M. WHEELWRIGHT, CITY ARCHITECT, BOSTON, MASS.

EUSTIS STREET PRIMARY SCHOOL, BOSTON, MASS. MR. E. M. WHEELWRIGHT, CITY ARCHITECT, BOSTON, MASS.

HOUSE NEAR MORRISTOWN, N. J. MR. ALBERT E. BARLOW, ARCHITECT, NEW YORK, N. Y.

HOUSE FOR MRS. HARRY WAINWRIGHT, PITTSBURGH, PA. MR. CHARLES BICKEL, ARCHITECT, PITTSBURGH, PA.

[Additional Illustrations in the International Edition.]

MOORISH FIREPLACE IN THE HOUSE OF HENRY G. MARQUAND, ESQ., NEW YORK, N. Y.

[Copper-plate Etching.]

THE VERMONT STATE BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. JARVIS HUNT, ARCHITECT, CHICAGO, ILL.

[Gelatine Print.]

HALTON, HERTS, ENG.: THE ENTRANCE-HALL.

SHOW-ROOM IN DUKE STREET, LONDON, ENG. MESSRS. ERNEST, GEORGE & PETO, ARCHITECTS.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

LIVE-LOADS AND SUPPORTS IN OFFICE-BUILDINGS.

New York, N. Y., February 16, 1894.

To the Editors of the American Architect: —

Dear Sirs, — The plea of Messrs. Jenny & Mundie "for reducing the live-load in calculating the columns of lower stories" seems to some extent well founded, but the method of explanation is an objectionable one. So far as office-buildings are concerned, the time and the rush of business are all through the structure the same, so that the average highest load must certainly occur simultaneously, if the number of offices "for rent" are not carefully distributed in the building.

The maximum of floor-load would be only in this case impossible, if the use of some floors like theatres, etc., requires a different time, otherwise it would be impossible to prescribe. Meetings in rooms 82 and 83 must be held at different time on account of a girder which carries only eighty per cent of the live-load, or the like. If we allow that this girder can carry twenty-five per cent more than it is designed for, why not do the same with floor-beams? Why not reduce the supposed floor-load all through the building?

I know of a similar proceeding only in bridge-designing regarding wind-stresses.

We calculate a bridge for a gale only and suppose that some exceptional tornado shock will always be within the elastic limits of iron. Still it happens that sometimes we are mistaken. In such cases a bridge will always be unloaded and deserted, so that this supposition, if once not justified, will certainly not be dangerous. In a building the matter lies quite differently, but if it must be conceded that we take only forty-four and one-half per cent of the live-load on basement columns and 15,000 pounds per square inch (20,000 inch-wind), that a densely-packed office-building will be quite an unsafe thing; an additional accident from wind, fire or explosion or some hidden defect supposed, it may collapse, especially if we remember that some steel has its elastic limit below 30,000 pounds per square inch.

I think we should be afraid of this saving and, as a rule, never save on the live-load, if once assumed. But there is another flaw in the chain which began with floor-load, which is calculated for the full load, and ended with the column, calculated for half the load, and it is in the floor itself. I do not doubt the reliability of the floor-beams, but I am not a bulky enough fellow that I could rely on them only.

I think for a safe floor it is very necessary to have a safe flooring itself. Has this been calculated for the whole load too? and what coefficient of safety has been used?

I remember only one case where the flooring has been chosen in regard to its actual strength and not on account of lower price and weight. The comparative tests in Denver, Col., have been extensively published in your valuable paper, March 28, 1891 and I can refer to them.

The three competing firms got the following figures:

	I.	II.	III.
Breaking load per sq. ft. 3′ loaded, 5′ span..	603	953	1670
Reduced to an equally distributed load.....	483	763	1316
Live-load, 70 pounds per sq. ft.....			
Tile-load, 40 " " " "			
Dead-load 40 " " " "			
Total load.....	150	150	150
Coefficient of safety.....	3.2	5.1	8.8

Trautwine requires for stone beams out of one piece (not in arch-like pieces like tile) a coefficient of safety 10 — 8.8, if this is a fair average, will do, but how about the others? The tile-beam No. III shows only thirty-eight per cent air, something I have never seen since. The lowest which I have found was fifty-five per cent and for such loads as mentioned above, I always found tile-beam less than ten inches in height.

Messrs. Jenny & Mundie will certainly do a great favor to the profession if they let us know, out of their great experience, how the tile-beams had to be calculated and the factor-of-safety which has been employed.

Yours respectfully, Fr. von Emperger.

Chicago, Ill., March 1, 1894.

To the Editors of the American Architect: —

Dear Sirs, — At your request I reply to the communication of Mr. Fr. von Emperger, of February 16.

First, I would refer to an exhaustive article on certain lines of this subject by C. H. Blackall, that appeared in the *American Architect*, Vol. XLI, No. 922, pp. 129-131, August 26, 1893.

In calculating the steel-skeleton construction for an office-building, it is our aim to provide for all the dead-load and for the maximum actual live-load that will obtain. This last can only be reached by actual estimates. The observations of Mr. Emperger would seem to be theoretical. An examination in the building, we believe, will demonstrate there in New York, as well as here, that the live-load provided for, of 70 pounds per square foot, does not obtain in any office in the building, and this extreme figure is used because of the possibility of an office being used for a gathering or meeting of as many as could even find comfortable standing-room, or a rush into a room or rooms, due to some special momentary attraction, and particularly in Chicago to satisfy the Building Ordinance. In such cases it would be best that a beam could be loaded temporarily its whole length with the maximum load of 70 pounds per square foot, but that the girders should have the full maximum load necessitates that at the same time two or more beams assembled to the girder on each side should be all loaded with this maximum load at one and the same time, which cannot be reasonably presumed, hence the reduction of the live-load of, say, 10 or 20 per cent.

In regard to the columns: The only columns in the building that we can reasonably presume will ever carry the maximum load, are the attic columns supporting the roof, which may be loaded exceptionally with a live-load of say 40 pounds per square foot on the roof, consisting of snow and ice. This we deem sufficient even in Chicago, because these important buildings are in charge of a custodian under whom is a head-janitor and chief-engineer. In case snow-storms follow each other without much diminution of former falls of snow or frozen rain, it will be removed by the force whose duty it is to watch for such conditions, so that 40 pounds is deemed to be sufficient. None of the offices are ever loaded to the calculated capacity of 70 pounds per square foot.

Messrs. Blackall and Everett made numerous estimates of the actual live-loads in office-buildings. See article in *American Architect*, No. 922, which is very exhaustive on this subject. Live-loads were found to range from a maximum in one single instance of about

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40 pounds to a minimum in several instances of 5 pounds. A live-load of 20 pounds per square foot on each floor would exceed the average. An estimate made by the George A. Fuller Company, the leading building-contractors of Chicago, gave but 6 pounds per square foot with the office comfortably full, with 9 pounds as an extreme maximum.

In offices and in hotel buildings so much space is taken up by light, though bulky, furniture that the live-loads are very low. In well-appointed fireproof buildings there are vaults which form a part of the dead-load, in every suite of offices, so that there are few or no safes. The heaviest load is generally found in the lawyers' offices, consisting of books. Even in theatres Mr. Blackall quotes the heaviest load obtainable as but 58 pounds, so that the 70 pounds per square foot which is used in calculating the beams in our office-buildings is forced upon us by the Ordinance, and is fully 20 per cent above what we would be justified in using. The foregoing, we believe, is a full justification of our methods of calculation.

In warehouses actual estimates must be made of the load they are intended to carry. It should neither be too light nor too heavy, for if too heavy it leads to an unnecessary expenditure, hence a waste. In warehouses the loads are distributed in the same manner as in office-buildings — full live-loads on beams, for they may receive it, but as there must be passageways to allow for the moving of goods the girders will only receive 80 or 90 per cent, according to the class of business.

There is a very good section in the Chicago Building Ordinance, that has been recommended by the writer for some years, requiring that there be displayed conspicuously on each floor of warehouses a placard stating the load per square foot of floor-surface, which may be safely applied to that particular floor, or in each particular locality should there be a variation.

The writer had occasion to estimate the actual loads carried in the dry-goods warehouses of Marshall Field & Co., in Chicago. The maximum load over limited areas was 57 pounds per square foot, with passageways between for the trucks moving boxes of goods, so that the maximum average was less than 50 pounds.

The more stories there are above any given column the greater will be the diminution of the live-load, hence, the reduction of live-load from the roof columns to the basement is justified by the facts. (See Blackall.)

With regard to the tile-arches forming floors — experience has taught us that all things considered, the most advantageous span between beams is about 6 feet. The longer the span the deeper the beams, hence the greater loss in clear heights of stories, a matter of importance in Chicago, as the height of fireproof buildings is now limited by law to 130 feet from sidewalk to highest part of the roof. These hollow-tile floor-arches are laid in a strong Portland-cement mortar — one of cement to three of sand. The joints are entirely filled. To be assured of this, a special superintendent is put at the building. The tile are all inspected on their arrival at the building and any soft or imperfect tiles are discarded and immediately removed from the premises. Numerous tests of these floors have shown them to be in every respect satisfactory. A roller 6 feet in diameter with 16-inch face, weighing about 1,800 pounds, I have seen rolled over these arches before they were concreted. Obstacles, such as brick, 2″ x 4″ scantling, etc., were placed before the roller and it was made to jump over them without the slightest effect on the arches. In one instance while we were making these tests a 12-inch I-beam, some 8 feet in length, fell three stories, destroying a floor-beam in its fall by buckling the webb, and struck on end on the top of the floor-arches beneath. It punched a hole through the top flange and fell over on its side, without otherwise disturbing the tile or injuring the soffit of the arch.

I note that Mr. Emperger speaks of the elastic limit of some steel at being below 30,000 pounds per square inch. Such steel is not used in Chicago for constructional purposes, other than for rivets. Our specifications are those published by the Carnegie Steel Company in their "*Pocket Companion*," the edition of 1893, edited by Kindl, which calls for an ultimate of 60,000 to 68,000 pounds per square inch, with an elastic limit of one-half of the ultimate. An examination of the test-sheets for the New York Life Building, shows an elastic limit ranging from a minimum of 34,190 to a maximum of 38,380; the ultimate ranging from 61,190 to 67,850 pounds per square inch. As we have a fibre stress of 16,000 we have a coefficient-of-safety of four.

Careful calculations are made for wind-pressure at 40 pounds a square foot and methods are provided to resist this pressure without exceeding the safety coefficient. Should a cyclone run the pressure higher it would be but for a short time. As yet none of the steel skeleton constructions in Chicago have been in the slightest degree injured by the wind, although a cyclone about a year ago struck the Home Insurance Building, blowing some lights of plate-glass out of the sash.

In conclusion. — These tall skeleton buildings, as they have been erected by the most experienced architects in Chicago, are designed and calculated with all the science, inspected and superintended with all the care and attention that is given to a railroad bridge of the first order, and we believe them to be fireproof, cyclone-proof and earthquake-proof. Certainly they have never shown the slightest signs of weakness under the severest tests to which they have been subjected.

W. L. B. JENNEY, *Architect.*

TRUSS NOT IN EQUILIBRIUM.

NEW YORK, February 20, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Replying to Mr. Hult's query of January 21, published in the current number of the *American Architect*, I would say that the truss as given in Figure 1 is not in equilibrium unless there is a load on the joint *e-f* sufficient in amount to neutralize the tension in the member 9–10 of Figure 2, which would counteract the bending moment now existing at the joint *d-e*.

The diagram given in Figure 3 is apparently correct, but the truss is an exceedingly awkward one to build or analyze, and, as built, is in danger of failing from the buckling of the member 6–7 and from the bending moment at the joint *d-e*. It would give me pleasure to explain obscure points to him or any other student of "Office Help."

Yours truly,

GEORGE HILL.

NOTES AND CLIPPINGS

A MOSS-COVERED DERELICT. — In 1881, when C. H. Hill, now of the Brazilian Navy, was on the "*Jeannette*" Relief Expedition to the Arctic regions, sent out by Government, his ship for a time was laid up at Reykjavik, the capital of Iceland. While there he saw a derelict float in and strike the wharf. It was at once made fast, and proved to be loaded with yellow pine lumber. The vessel was literally covered with moss and barnacles, and investigations disclosed the fact that the name of the old craft, that for years by tide and winds had been driven hither and thither, was the "*Jamestown.*" The inhabitants of the capital thought that a great prize had fallen into their hands. Everybody turned out and took a hand in unloading. The lumber came out in good condition, and the Reykjavikans estimated that there was enough of it to last them for twenty-five years. But, alas, what a world this is as a hope-crusher! After the people had unloaded and piled the lumber, the Denmark Government stepped in and confiscated it and started a lumber-yard of its own. On return of the "*Jeannette*" Expedition, Government made inquiry regarding the "*Jamestown*," and learned that she was loaded in Pensacola, Fla., in 1865, soon after the close of the Civil War. Thus, for sixteen years the lumber-laden vessel had floated as a derelict on the high seas. — *Northwestern Lumberman.*

COLONNE DE LA GRANDE ARMEE. — The Napoleon Column at Boulogne-sur-Mer, or Colonne de la Grande Armée, as it was commonly called in France, and from which the statue of Napoleon has fallen, stood on the high ground back of the town, to mark the site of the great camp of 1804, which Napoleon I had formed preparatory to his projected invasion of England. Here he had concentrated 180,000 men and 2,400 transports, and was about ready to swoop down upon England with them when the war with Austria afforded them other employment. So certain was he of invading the country that he had a medal struck off, bearing the inscription, "Descente en Angleterre: frappé à Londres, 1804." His intention was to sweep the channel of the English fleet with the combined fleets, of France, Spain and Holland, and then to land his men on the opposite shore by means of his transports. The Colonne de la Grande Armée was a marble shaft, 166 feet high, of Doric design, surmounted by a bronze statue of the Emperor in his coronation robes, by Bosio. The corner-stone was laid by Marshal Soult in 1804, and the work commenced by the Grande Armée. It was not until 1841, however, that the shaft was completed and surmounted by the statue. — *Boston Transcript.*

A REMARKABLE TRANSFORMATION SCENE. — Louis XIV once remarked impatiently, in the hearing of the Duc d'Antin, superintendent of the royal buildings, that he hoped some time a forest, which he always disliked, because it obstructed one of his favorite views, would be cut down. Unknown to the King, the Duc d'Antin had the trunks of all the trees in the objectionable forest sawed through near the ground in such a way that they still stood, though a slight pull would bring them down. He removed every evidence of the work, and fastened ropes to the tops of the trees and concealed more than 1,200 men in the forest to manage the ropes at a signal from him. D'Antin knew on what day the King would walk in the wood, and planned his work accordingly. The King took his accustomed promenade, and, as usual, he expressed his sentiments about the hated forest. "Your Majesty, the forest shall be removed whenever you like," said D'Antin. "Indeed," said the King, "then I wish that it might be done at once." At that moment D'Antin blew a shrill blast from a whistle, and, to the utter amazement of the King and the royal party, the forest fell as if by enchantment. — *Exchange.*

THE GERMAN PARLIAMENT-HOUSE. — A share of the indemnity derived by Germany from France after the war of 1870–'71 was set apart for the erection of an Imperial Parliament-House in Berlin. It amounted to 24,000,000 marks, and was put out at interest until 1877, when a new arrangement was made. The share had by that time increased to 28,719,964 marks. Up to the present the outlay on the building has been 27,925,000 marks. The Reichstag Palace has, therefore, not needed an appeal for supplementary votes, and this fact suggests the rigorous organization which extends to civil, no less than to military, affairs. There is not only a balance of 794,964 marks, which can be utilized for imperial purposes of another kind, but a sum of double the amount is likely to be obtained from the vacant land which was not built over. It has been stated that the building has not gained the approval of the Emperor, but the financial aspects of the undertaking deserve to be recognized as satisfactory. — *The Architect.*

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The Grotesque in Art. — Nowhere is the physician more directly opposed to the artist in his judgment than on the subject of grotesques. Take, for example, the grotesque head carved on the base of the tower of Santa Maria Formosa at Venice. Of this, Mr. Ruskin says: "A head — huge, inhuman and monstrous — leering in bestial degradation, too foul to be either pictured or described, or to be beheld for more than an instant. Yet let it be endured for that instant, for in that head is embodied the type of the evil spirit to which Venice was abandoned in the fourth period of her decline. . . . This head is one of the many hundreds which disgrace the latest buildings of the city, all more or less agreeing in their expression of sneering mockery, in most cases enhanced by thrusting out the tongue. They are evidences of a delight in the contemplation of bestial vice and the expression of low sarcasm, which is, I believe, the most hopeless state into which the human mind can fall." It is rather refreshing, after this uncomfortable judgment on poor Venice, to turn to the doctor's diagnosis. M. Charcot writes: "In our opinion, this distortion of the features, which gives the mask so grotesque and hideous an aspect, is by no means the result of a mere artistic whim. Nature, in her infinite variety of forms, is a mine of inexhaustible richness, where the beautiful and the ugly, the harmonious and the deformed, are mingled with intermediary degrees. The artist of Santa Maria Formosa, seeking for a grotesque type, seems to us to have met one in his path, to have seen it with his eyes, seized it in passing, and reproduced it with a fidelity which enables us at this day to recognize in it the signs of a pathological deformation of a nervous affection, clearly defined, of which we have had under our notice at La Salpêtrière very interesting examples. The case in question is evidently a spasm of the face, and presenting characters so marked that it is impossible to confound it with any other facial and spasmodic affection." Thus the physician comes to the rescue of the artist, and reveals a mere naturalistic *tour de force* in what the artist has read as "a delight in the contemplation of bestial vice." — *London Hospital.*

Richmond's State Capitol. — Best of all that is in Richmond I liked the ancient State Capitol, copied far from exactly after a building in France which Jefferson admired, built before our Constitution was formulated, and having as a mere episode in its lifetime a stormy service as the Capitol of the Confederacy. To-day it is sacred for all Americans. It shelters Houdon's Washington, and its historic walls are burdened with paintings in number and character ample to form a gallery of the portraits of famous Americans. Pocahontas's sad face is there, and so are the countenances of Light-Horse Harry Lee and Jefferson, of Capt. John Smith and of President Tyler and his father, a one-time Virginia Governor. Gens. Johnson and Jackson and Robert Lee and Fitzburgh Lee are in the painted assembly, put there by a reverent prompting, which every true man respects. From the basement to the roof there is no spot in the splendid and substantial old edifice whose story or ornaments do not stir the heart of all Americans who go there. It teaches us that the whole country is bound by ties stronger and warmer than accident or commerce can make, for Richmond's Capitol is hers only in name and in trust. In full fact it is as much ours in New York and in Bangor and San Francisco, in Texas, and wherever the stars and stripes are flung out. — *Julian Ralph in Harper's Weekly.*

The Fall of the Vendome Column. — I had got the statue into line with a chimney in the Rue Castiglione, so as to be able to detect the slightest oscillation, but there was none at all — the column, all wounded as it was, stood immovable. Five minutes passed, five minutes of excited hope to me, for, from the braveness of the resistance, it almost seemed as if the destroying brutes would not be able to succeed. At last a shiver ran down my back; I had become conscious, after a particularly savage jerk on the ropes, that the line between the chimney and the statue was no longer exactly straight. Slowly — very slowly — the statue swerved past the chimney; slowly the great column bowed toward me — never did any one receive so superb a salutation; slowly it descended, so slowly that it almost seemed to hesitate; in a great haze of spurting dust it fell. There was scarcely any noise, and no tremor of the air or ground; but the twenty feet of fagots were flattened down to nothing, and the dust rose thick like fog. With a wild rush and frantic shouts the people dashed past the sentries into the Place Vendôme, leaped upon the dislocated fragments, and howled coarse insults at them. Mournfully I went away, murmuring to myself, "Poor France!" — *Recollections of the Commune: Blackwood's Magazine.*

London Fires. — It appears from the report of the chief officer of the Fire Brigade to the London County Council, that the fires of 1893, compared with those of 1892, show an increase of 264, or, compared with the average of the past ten years, an increase of 997. The number of fires in 1892 was 3,146 (serious, 177, slight, 2,969); those of 1893 amounted to 3,410 (serious, 180, slight, 3,230). The average for the ten years, 1883 to 1892, was 2,413 (serious, 166, slight, 2,247). The number of fires in the metropolis in which life has been seriously endangered during the year 1893 has been 107, and those in which life has been lost has been 45. The total number of calls during the year, including those for actual fires, supposed fires, chimney-fires and supposed chimney-fires, has been 6,462, or nearly 18 a day; of 1,163 false alarms received during the year, 606 have been malicious calls sent through the fire-alarm call-posts. — *Journal of the Society of Arts.*

The Texas Dugout. — Dugouts have been a great help to Texas. Many a herd has been kept and many a farm has been cultivated which never would have been till years later had the owner been obliged to wait till he could build him a house of wood or brick. Some are dug straight down into the ground, while others are dug in the side of a hill. The one in which I recently spent the night was of the former kind. It was 15′ x 20′ at the bottom and about seven feet deep. About three feet from the floor the walls were abruptly widened out, thus giving a shelf in the solid earthern wall some three feet wide and extending around the whole of the room. This was an exceedingly convenient arrangement, as it answered for chairs, dining-table, miscellaneous shelving and beds, all in one. My friend had cut a fireplace of proper size in the solid dirt wall, and by means of a post-hole auger had bored a chimney down to it. One single joint of stovepipe projected from the top of this chimney out into the open air. Looking up from within, I could see the structure of the roof. One log had been laid across the dugout in the direction of its greatest extent, and did duty as a ridgepole. Smaller ones were placed with one end on this and the other on the ground, just as the rafters of a house are arranged. Hay had been thrown on top of these, and above all a pile of dirt had been banked up. There was a slanting door in this, like that of a cellar, and leading up to it was a flight of steps. These were rather steep, but one was not afraid of their breaking down with him: they were cut in solid dirt. Under ordinary circumstances one might have objected to the room on the score of its having nothing resembling a window, but with the temperature outside as it was, this was an advantage rather than otherwise. A bright roaring fire burned on the hearth, and as we reclined on the blankets spread over our shelf-like beds, I thought the whole scene an embodiment of substantial, comfortable and picturesque luxury. We could hear the wind howling and roaring outside, but aside from this there was nothing to indicate that the first norther of the season, and one of the fiercest known for years, was raging outside. — *St. Louis Globe-Democrat.*

Courts may control Court-houses to their own Comfort. — The Courts have sufficinet power to compel the county authorities to furnish proper accommodations if they choose to exercise the power. The Supreme Court of Indiana, not long ago, held that a court might order the person in charge of the elevator in the court-house to operate it during the sessions of the court, and on his refusal might direct the sheriff to take charge of the elevator. The Court, it was held, could not be impeded in its functions by any other department of the Government. The Supreme Court in this country has more than once exercised its power by directing the sheriff to dispossess city officers from rooms in the court-house needed for court purposes. The Court of Common Pleas of Bucks County, a few months ago, had a controversy with the County Commissioners who took on themselves the appointment of men to take care of the court-house, manage the fires and clean the rooms. The Court decided that it had the power to control the court-house, and it appointed two "tipstaffs," or court officers, assigning to one the duty of taking care of the court-house and its approaches and discharging the duties usually performed by janitors as to that part of the building used for court purposes. The other tipstaff was directed to attend to the fires and heating of the court and jury rooms to the exclusion, if necessary, of other parts of the building. — *N. Y. Tribune.*

A Collector's Good Fortune. — An American collector the other day discovered in the place of a dealer in old books and manuscripts in the City of Mexico where few Americans ever go, being very remote from the centre of the city, an image of the Virgin del Carmen, in the manner of Murillo, about eighteen inches in height, so exquisitely wrought that it instantly attracted his attention. The carving was perfection: not a detail shunned, and evidently the work of some wonderful artist. The coloring was delightfully soft and artistic. The hands of the image were marvellously done. Inquiry showed that this fine bit of carving was by the famous Mexican sculptor, architect and poet, Tresguerras, who flourished long ago in Queratarо, and who built the church at Celaya, which has the most perfect domes in the New World! The image, carved from wood, is a copy of a life-size image of the Virgin del Carmen by the same versatile genius. This rare image was purchased for a small sum, but the ordinary collector would not have discerned its value. It was bought without knowledge of its origin, which, when subsequently learned, justified the collector's taste. — *F. R. Guernsey in Boston Herald.*

Six Inches of Snow in Venice. — The severe cold which swept over the whole of Italy, three weeks ago, did not spare Venice. The snow is five or six inches deep, and more where it has drifted. A correspondent, who was there a day or two ago, says that the streets and the Piazza were almost deserted. At San Marco the bright mosaics and bronze horses looked out of place and unhappy under their snow coverings. The snow was cleared away from the roads, and great heaps were made in the Piazza. On the narrow pathways it froze so hard that it was difficult to keep one's footing. The lagoons from Mestic and all along the mainland are one sheet of ice, stretching almost to Venice itself, and large masses are floating in the Grand Canal. Anything more funereal and gloomy than the sight of the black gondolas creeping about with snow on them cannot be imagined. Great suffering and misery prevail among the poor. — *London Daily News.*

Gladstone Honors Art. — Mr. Burne-Jones is the fourth artist on whom the dignity of a baronetcy has been conferred during the reign of Queen Victoria, the others being Sir John Millais, Sir Frederick Leighton, painters, and Sir Edgar Boehm, the sculptor. Had Mr. Watts accepted, he would have made a fifth. It is noted that to Gladstone are due the thanks of the artistic world for this recognition in four out of the five instances, Lord Salisbury having been responsible for the title that was conferred on the late Sir Edgar Boehm, the sculptor. It was also Mr. Gladstone who made Alfred Tennyson a peer. Lord Salisbury recognized science, instead of poetry or art, by transmuting Mr. Thomson, the famous electrician, into Lord Kelvin. — *Boston Herald.*

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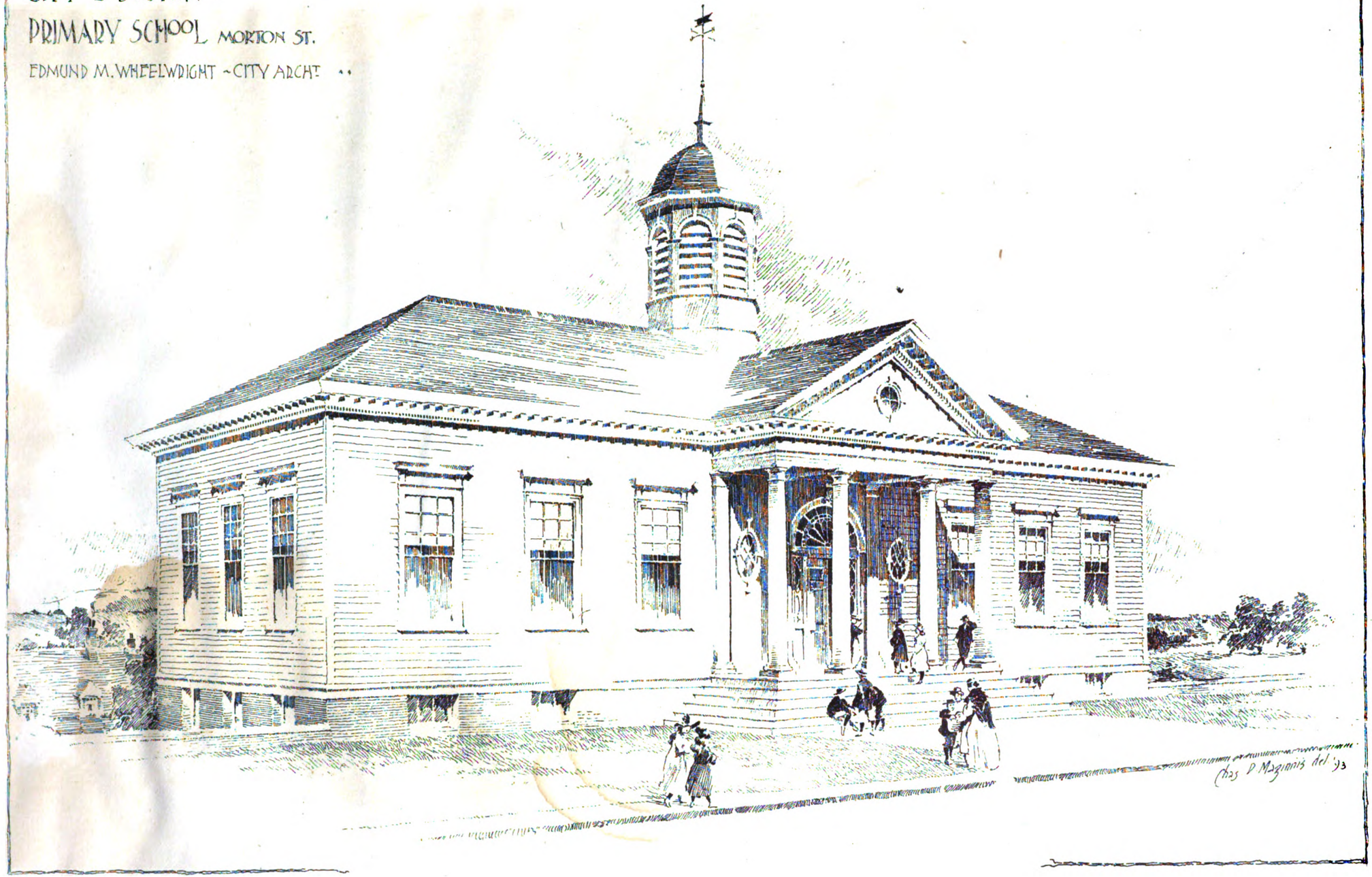


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ARCHITECT

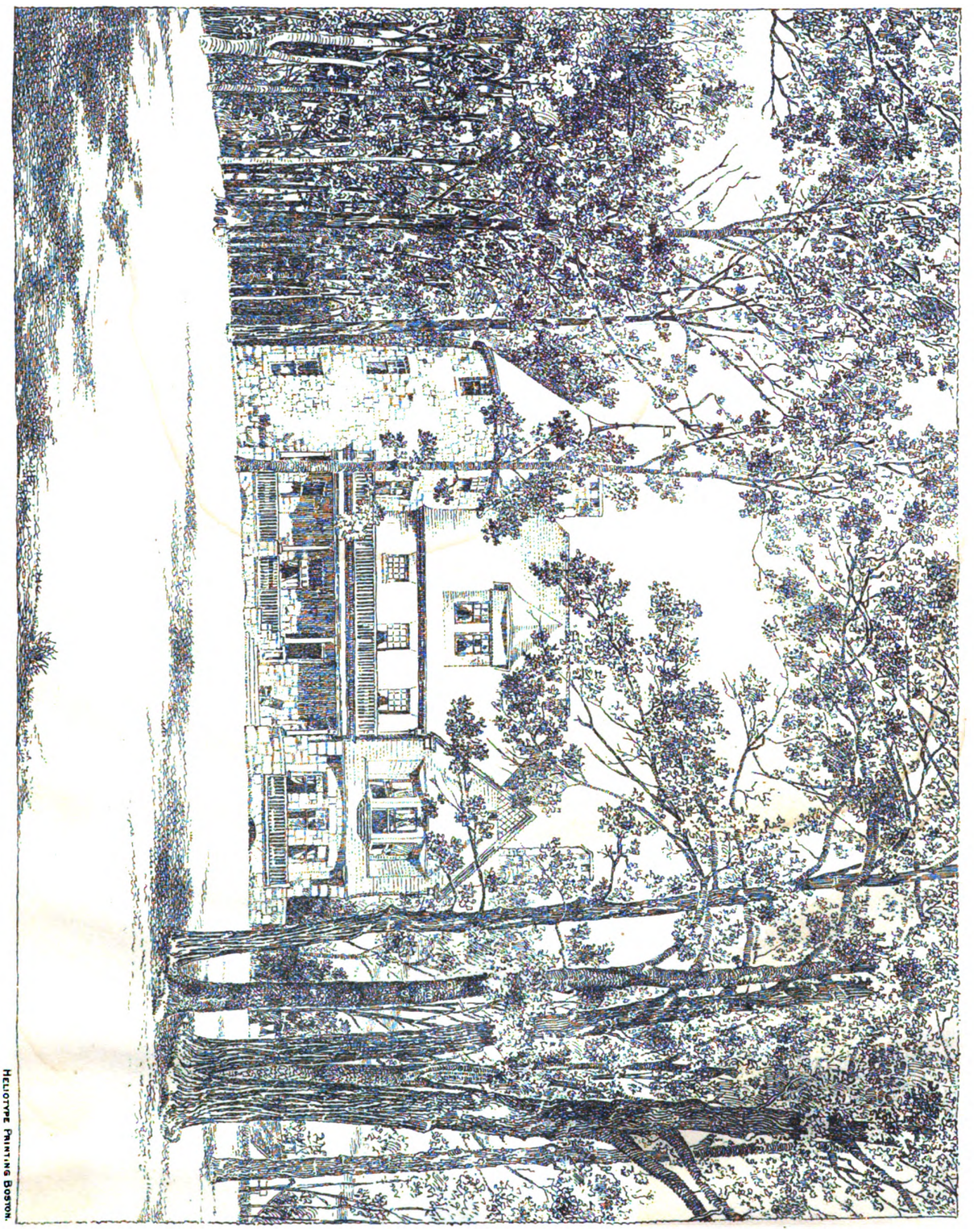


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ALFRED E. BARLOW, Architect, 149 Broadway, N. Y.

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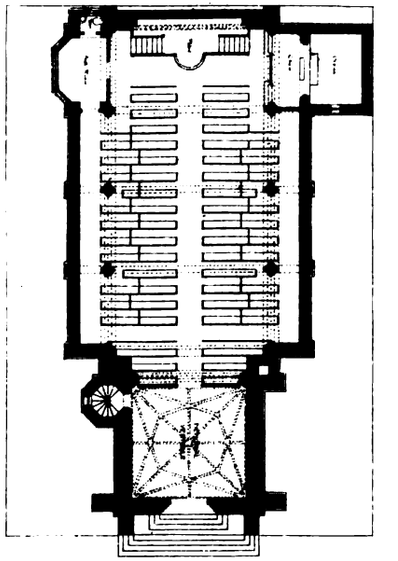
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DESIGN FOR THE FIRST CHURCH AT PLYMOUTH

CRAM, WENTWORTH & GOODHUE, ARCHITECTS.
53 STATE ST. BOSTON, MASS.





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THE AMERICAN ARCHITECT AND BUILDING NEWS.

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SOME little progress appears to have been made toward putting the official architecture of the United States on a civilized basis, through the recent visit of the Institute Committee to Washington. Hitherto, the Treasury officials, supported, it is said, by the present Supervising Architect, have treated the plan of procuring designs for public buildings by competition, as provided by law, with supercilious contempt, characterizing the plan as impracticable, unnecessary, extravagant and so on, and suggesting that the Institute of Architects procured the passage of the law for its own purposes. Now, a change seems to have come over their sentiments, or, at least, over their expression of them. Instead of finding the provisions of the law "unnecessary," we are told by the Washington *Star* that the Treasury officials "have no disposition whatever to antagonize the desire of Congress for an improved architecture in public buildings," and that "the only reason why the statute providing for open competition in the designing and planning of such works has not been enforced is because of the conviction that enforcement of the law in its present shape is impracticable." It may be remarked that the statute does not provide for "open competition" in such cases, but for competition among not less than five architects, who may be invited as the Secretary of the Treasury shall deem proper, and it seems that this is the point in which the Treasury officials find the difficulty. "The trouble is," we are told, "as to the manner of selection. Shall he [the Secretary] be governed by the wishes of the Senators of the State, the Representatives from the district, the Governor of the State, the Mayor of the city, the Chamber of Commerce, the local political organization, the individual citizens, or the American Institute of Architects?" Besides the terror which the prospect of entertaining delegations from all these bodies, on the occasion of selecting the competing architects for every new building, inspires in the Secretary, it appears that he finds perplexity in the process by which the successful design shall be selected. "He cannot be expected," we are told, "to have a complete technical knowledge of architecture, or even a general knowledge on the subject sufficient to tell which of the many plans submitted is really the best for the purpose required"; and he discovers another difficulty in the vagueness of the law "as to where the work of the successful competing architect ends, and that of the Government architect begins," while he thinks that another objection to the bill is that it will add greatly to the expense of the work, "since the organization of the Treasury architect's office will have to be continued . . . and all the other expenses of designing and supervising will be extra."

IT is obvious enough to any one who has studied the operation of the Government Architect's office that the last two difficulties in the execution of the law could best be met by abolishing the office altogether. It is notorious that the cost of the professional work done in it is, as a rule, much greater than the cost of the same work done by a private architect, and it is not so well done, while such supervision of public building work as has been secured under the system which has controlled it for so many years, would not be tolerated for a week by any private architect of reputation. In fact, under the present system there is practically no responsibility. All the officials who control and direct public building are salaried servants, the consequences of whose incapacity and neglect the Treasury, which hires them, must bear, and does bear, to the tune of many thousand dollars every year; while a private architect, under the ordinary contract of employment, is responsible to the whole extent of his property for faithful and skilful discharge of his duty. In other countries, this responsibility secures the best professional service that it is possible to render, at a cost no greater, and generally less, than is paid by our Treasury for irresponsible and inferior service, and our architects are quite as skilful and faithful as those in other countries. The other objection, that the Secretary of the Treasury, "not having a complete technical knowledge of architecture," could not be sure of selecting the best design, can hardly be serious. The methods of obtaining the best expert advice in selecting among competing plans are as well known here as anywhere, and the pretense of being ignorant of them is simply ridiculous. Altogether, judging from the article in the *Star*, the Treasury authorities seem, through the quiet pressure which is being exerted upon them by members of Congress, and by the public press, rather than by the professional architects, to be gradually retreating into a corner, defending themselves by arguments which grow less and less substantial. Apparently, the only real hope of those who wish to perpetuate the present system lies in an attempt, under some pretext, to get the existing statute before Congress for modification, and, seizing a favorable opportunity, to bring about its repeal, or suspension, or, possibly, such change as will amount to repeal. The Committee of the American Institute of Architects would do well to look out for such attempts, and if they are averted, there seems to be a good prospect that another year will see the law reluctantly put in operation.

AN ingenious method of repairing foundation work injured by springs was recently employed on the North Sea Canal, the great water-way which connects Amsterdam with the North Sea. Of late years, the commerce of Amsterdam has rapidly increased, and the locks at the entrance of the Canal, which protect it against the influence of the tides, are no longer capacious enough to accommodate the traffic, or large enough to admit the immense steamers which would make Amsterdam their port if they could. Two years ago, it was resolved to build a new lock, of the requisite size, and the work has since been going on. The foundation of the immense lock walls is of concrete. All precautions were taken in laying the concrete, and the bed was enclosed with sheet-piling, and pumped nearly dry before the foundation was laid; but, before beginning the excavation, several borings had been made, which pierced the stratum of clay underlying the basin; and, on pumping out the excavation, the water rushed in great jets through these holes, as it would from an artesian well. The concrete was laid over these jets, but the cement was washed out of it by the water to such an extent that the skilful engineers in charge of the work, MM. Van Meren and Bekaar, resolved not to leave such doubtful spots in the foundation, but to strengthen them by some means. MM. Mortier and Thouvard, contractors, have the honor of suggesting to the Government engineers the plan which was finally adopted, and which they were employed to carry out. Briefly, their proposition was to suppress the springs by means of compressed-air, until the concrete put over them could harden sufficiently to be out of danger from them. In order to apply the compressed-air, the contractors first moulded domes of concrete, about thirty feet in diameter, but varying according to

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the dimensions of the spot of imperfect foundation which it was desired to make good, and with a shell three or four feet thick. In the top of each of these, an air-lock, consisting of an iron cylinder, with the necessary doors, was set, and through the air-lock the workmen passed in and out, and materials were carried. A pipe was driven through the foundation, outside the dome, to the spring beneath it, so as to give an escape for the water; and air was then forced into the dome. As there was no escape for the air, the dome being firmly cemented to the sound part of the foundation, the flow of the spring was checked, and finally reversed, the water discharging through the pipe over the surface of the firm concrete outside. Meanwhile, the workmen under the dome dug out the washed and crumbling concrete, which was passed out through the air-lock, and fresh concrete put in its place. The new concrete, being no longer exposed to washing, soon became as hard as that around it, and capable of resisting perfectly the effect of the springs. In this way all the doubtful spots were repaired, and the stone walls of the lock are now being laid, on a foundation which *Le Génie Civil* calls "irreproachable."

THE *Revue Industrielle* says that, after April 5, 1894, the Bureau of Weights and Measures at Washington will regard the Continental metre and kilogramme as the fundamental standards, and the ordinary measures in use in the United States, such as the yard, the pound, and so on, as derivatives from the metric standard. The *Revue Industrielle* says that this decision amounts to a formal adoption of the metric system of weights and measures by the Government of the United States. If so, an important step has been taken, without exciting as much public interest as it deserves. Although the use of metric weights and measures has long been legalized in the United States, the Government has done little or nothing to favor it, and, while kilograms and centimetres are now familiar measures, they have become so simply because the public demanded them. It may be imagined that people, for example, who have had to buy or sell by Apothecaries', or Avoirdupois or Troy Weight, or by Wine Measure, Dry Measure and the other kinds of measure, with their three sizes of ounces, two sorts of quarts and pints, two varieties of tons, and the other ridiculous and costly absurdities of the old system, have hailed with joy the opportunity of using a rational standard. Already, the formulas for compounding drugs and chemicals, sent out by manufacturers, are almost always given in grammes and centimetres, sometimes alone, but more usually with a translation into Troy or Avoirdupois or Apothecaries' Weight appended, for the benefit of conservative customers. The number of the latter is, however, falling off daily, and a little effort on the part of the Government officials would see Apothecaries' and Troy Weight, at least, with their "pennyweights" and "scruples" and "drachms," relegated to oblivion, to the immense relief of a large part of the public, and of the mercantile community. If we might venture a suggestion, it seems to us that a good way to begin would be, if there is to be a new tariff, to base the Custom-house weights and measures on the metric system, at least so far as goods from Continental countries are concerned. As goods from these countries are packed and invoiced by metric standards, a great deal of calculation would be saved by levying duties according to the same standard, while consumers would soon learn the advantages of following the same course.

M. ANTONY WABLE, in *La Semaine des Constructeurs*, makes a novel proposition, which is certainly worth considering. Speaking of the small exhibitions of pictures, those of the various artistic clubs and societies, which have become much more fashionable than the Salon exhibitions, with their interminable thousands of works of all sorts, he suggests that, as the public goes to see things in the "Petits Salons" which would be neglected in the great ones, the architects, whose section in the official exhibition rarely excites any interest, might imitate the proceedings of the painters, and, instead of collecting a great mass of miscellaneous elevations, restorations, plans and details, divide what they have to show into small, separate groups of works with a common purpose, or, possibly, a common æsthetic idea. For instance, as he says, the enthusiastic young architects who feel themselves capable of inventing a new style might unite their forces in bringing before the public a comparative view of their notions of twentieth-century architecture; while others might excite interest by showing their ideas of a given problem of the day; and there would be a place, even, for a collection of what he calls the "dreams" of architects. The last proposition, particularly, has a good deal to recommend it. Architects do not find much encouragement in their daily practice for indulging in dreams, but it would certainly favor their artistic development to be able to do so occasionally, and a small annual exhibition of designs for things never to be built would enable, and, perhaps, encourage them to spend a few hours occasionally in purely artistic imagining. Among us, Mr. H. P. Kirby, with Mr. Schladermundt, and, perhaps, one or two others, are among the few who have shown the results of such exercises, but the enthusiasm with which their work has been received in the profession indicates that there is a real appreciation among us of the high artistic qualities necessary for producing it. What, however, Mr. Kirby has done with his picturesque groups in late French Gothic, others might do in Spanish Renaissance, or the pure Classical styles, and, while no exercise would bring out better the artist in an architect, nothing would show more quickly than such an exhibition the difference between the real artists and the judicious copyists.

A GREAT archæological as well as engineering work has been accomplished, in the draining of Lake Copais, in Bœotia. The ancient legend is that this lake was formed by Hercules, who flooded the plain by diverting or checking the river Alpheus; and in the bed of the lake may actually be seen, not only a system of aqueducts, but the traces of a town, with remains of a palace, which, in plan, resembles that of Tiryns. As the water of the lake has prevented any interference with the place since the time, if not of Hercules, at least of the earliest history, it may be expected that archæology will find a rich treasure. According to the *Builder*, the remains should belong to the period of the Minyæ, the people who were driven out of Greece by the Pelasgi, themselves a race of almost fabulous antiquity. Twenty-five hundred years ago, the Greeks spoke of the Pelasgi, the traditional race which had inhabited the country a thousand years previously, as "the Ancients"; yet, if the *Builder's* theory is correct, the ruins in the Lake Copais were old before the time of the Pelasgi, and belonged to people of whom the Greeks knew nothing except that their king was the son of the Sea and the Storm-wind's daughter, and that his three daughters ate a child, and were afterwards changed into bats.

TWO chemists of Hamburg, MM. Forster and Nijland, have published some studies on the cholera infection, from which it appears that soap is one of the best known sterilizers of water suspected of infection. For a long time after the cholera epidemic of last summer, the people of Hamburg were afraid even to bathe themselves with Elbe water, but MM. Forster and Nijland show that ordinary toilet soap, added at the rate of an ounce to about twelve quarts of water, will kill the cholera bacilli in ten minutes. This would be a large proportion of soap to use in a bath, but, as most people, instead of dissolving soap in the bath-water, apply it to the skin with a sponge, it is probable that the water actually brought in contact with the skin is generally soapy enough to be harmless. If, however, it is desired to obtain greater security, a soap containing a small quantity of corrosive sublimate may be used. Many "complexion washes" contain this drug, which is said to have a beneficial effect on the skin, however dangerous it may be internally, so that no hesitation need be felt in employing soaps medicated with it, and a very small quantity is sufficient. With a soap containing one per cent of corrosive sublimate, added at the rate of a quarter of an ounce of soap to sixty quarts of water, all the cholera bacilli will be killed in one minute, and half the dose will kill them all in ten minutes; while the sublimate alone is still more active, an ounce being sufficient to destroy, in five minutes, all the cholera microbes in about a million quarts of water.

ONE of the most eccentric artists in England, though, in his way, a very good one, has been rewarded for his talent in a rather curious way by being created a baronet, under the title of Sir E. Burne-Jones. It is not that a title is an unusual reward for meritorious artists in England, but it seems quite natural to think of Sir Frederick Leighton, or Sir John Millais, in connection with the types of high-bred English character which they understand and represent so well; while Mr. Burne-Jones's mermaids and things will hardly know what to make of him with his coronet and red hand.

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OFFICE-HELP FOR ARCHITECTS.[1]—XXVI.

CHAPTER IX. — FLOORS.

§ 323. Distribution of Material: — Chapter III treated of the strength of the members of which a floor should be composed; but it is not alone necessary that the floor should be strong enough or stiff enough; we should go farther and know that it is the most economical that can be built. In frame construction, the spans are usually restricted to 20′ 0″ or 25′ 0″. For the best results it should always be made 20′ 0″ or under, as that gives a size of floor-beam most easily obtained. If steel I-beams are two cents a pound, it is cheaper to use them than wood for girders in spans of 20′ 0″ or more. In fireproof construction, especially where it is desired to support the floors largely by means of columns, the distribution of the columns has a marked effect on the economy.

TABLE XXXVIII.

DATA RE FIREPROOF FLOOR FRAMING.

Beams. $S = 12{,}500$	Depth	6″	6″	7″	7″	8″	8″	9″	9″	10″	10″	12″	12″	15″	15″
	Weight per foot, lbs.	13	16	15.5	20	18	22	21	27	25.5	33	32	40	41	50
	Length of span l	10′ 0″	10′ 0″	11′ 8″	11′ 8″	13′ 0″	13′ 0″	15′ 0″	15′ 0″	16′ 8″	16′ 8″	20′ 0″	20′ 0″	25′ 0″	25′ 0″
	Spacing on centres (a)	3′ 9″	4′ 0″	3′ 10″	4′ 6″	4′ 0″	5′ 0″	3′ 11″	5′ 3″	4′ 3″	5′ 6″	4′ 5″	5′ 7″	4′ 4″	5′ 4″
	Weight of beam, lbs. per sq. ft.[1]	3.5	4.0	4.0	4.5	4.5	4.4	5.3	5.2	6.0	6.0	7.2	7.1	10.6	10.7
	L in thousands of lbs.[2]	6.56	7.00	7.85	9.17	9.10	11.37	10.28	13.75	12.4	16.0	15 4	19.5	18.92	23.3
Girders. $S = 16{,}000$	$l = 3a$ Depth	9″	10″	10″	10″	10″	12″	10″	15″	12″	15″	15″	15″	15″	15″
	Weight per ft., lbs.	21	25.5	25.5	31	28	36	31	41	33	48	41	60	44	65
	Weight of girder, lbs. per sq. ft.[1]	2.10	2.55	2.18	2.66	2.15	2.77	2.06	2.74	1.98	2.88	2.04	3.00	1.76	2.61
	l	11′ 3″	12′ 0″	11′ 6″	13′ 6″	12′ 0″	15′ 0″	11′ 9″	15′ 9″	12′ 9″	16′ 6″	13′ 3″	16′ 9″	13′ 0″	16′ 0″
	$l = 4a$ Depth	12″	15″	12″	15″	15″	15″	15″	15″	15″	15″	15″	15″	15″	15″
	Weight per ft., lbs.	32	41	40	46	41	60	44	82	55	96	80	120	91	140
	Weight of girder, lbs. per sq. ft.[1]	3.20	4.10	3.42	3.94	3.16	4.62	2 81	5.47	3.30	5.77	3.97	6.00	3.65	5.60
	l	15′ 0″	16′ 0″	15′ 4″	18′ 0″	16′ 0″	20′ 0″	15′ 8″	21′ 0″	17′ 0″	22′ 0″	17′ 8″	22′ 4″	17′ 4″	21′ 4″
	$l = 5a$ Depth	15″	15″	15″	15″	15″	15″	12″	15″	15″	20″	15″	20″	15″	20″
	Weight per ft., lbs.	41	48	49	70	60	91	80	120	91	128	110	140	140	160
	Weight of girder, lbs. per sq. ft.[1]	4.10	4.80	4.20	6.00	4.62	7.00	5.33	8.00	5.47	7.68	5 50	6.98	5.60	6.40
	l	18′ 9″	20′ 0″	19′ 2″	22′ 6″	20′ 0″	25′ 0″	19′ 7″	26′ 3″	21′ 3″	27′ 6″	22′ 1″	27′ 11″	21′ 8″	26′ 8″
Arch Blocks. Old style, Form (a)	Minimum depth of	6″	6″	6″	7″	6″	7″	6″	8″	7″	8″	7″	8″	7″	8″
	Weight of block per sq. ft.	29	29	29	33	29	33	29	37	33	37	33	37	33	37
	Weight of filling per sq. ft.	5	5	15	5	25	15	35	15	35	25	55	45	85	75
	Weight of total per sq. ft.	34	34	44	38	54	48	64	52	68	62	88	82	118	112
	Safe general live-load per sq. ft.[3]	250	250	240	250	230	230	220	230	220	230	200	200	190	190
	Cost of block and filling, cents per sq. ft.	15	15	18	17	21	21	24	23	26	26	32	32	41	41
	Maximum depth of	6″	6″	7″	7″	8″	8″	9″	9″	10″	10″	12″	12″	12″	12″
	Weight of block per sq. ft.	29	29	33	33	37	37	40	40	43″	43	48	48	48	48
	Weight of filling per sq. ft.	5	5	5	5	5	5	5	5	7	7	10	10	30	30
	Weight of total per sq. ft.	34	34	38	38	42	42	45	45	50	50	58	58	78	78
	Safe general live-load per sq. ft.[3]	250	250	250	250	250	240	240	240	230	230	230	230	210	210
	Cost of block and filling, cents per sq. ft.	15	15	17	17	20	20	22	22	24	24	28	28	34	34

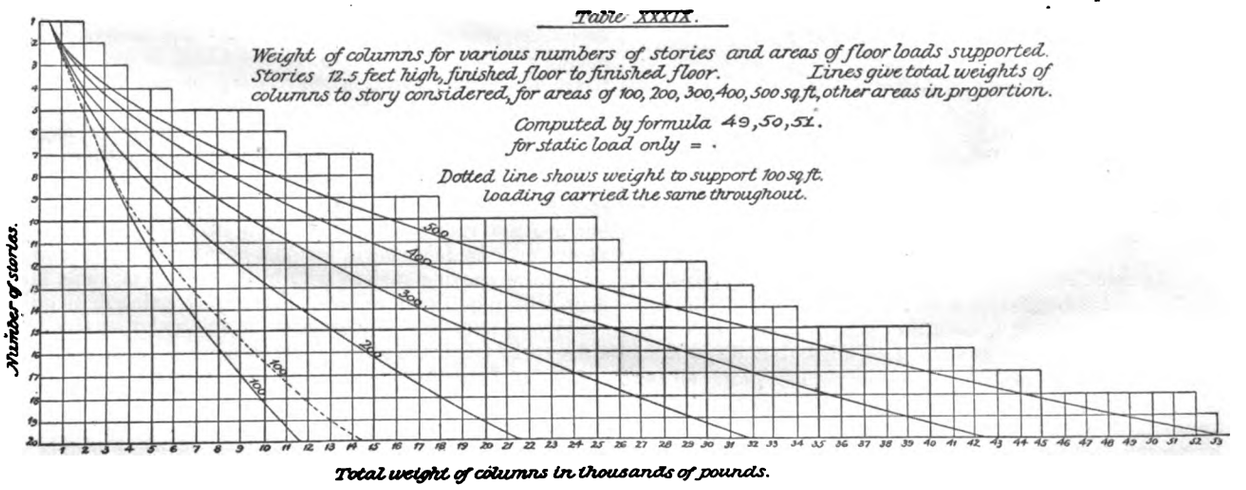
[1] Based on area supported.
[2] Based on 175 pounds per square foot, total dead and live load.
[3] Limited to an area of arch that will give the stated fibre strain.

Table XXXIX.

Weight of columns for various numbers of stories and areas of floor loads supported. Stories 12.5 feet high, finished floor to finished floor. Lines give total weights of columns to story considered, for areas of 100, 200, 300, 400, 500 sq ft, other areas in proportion.

Computed by formula 49, 50, 51. for static load only = .

Dotted line shows weight to support 100 sq ft. loading carried the same throughout.



Total weight of columns in thousands of pounds.

Taking into account the elements of sizes of columns, size of openings, relation between r and l, size

[1] By George Hill, Consulting Engineer. Continued from No. 947, page 76.

ABBREVIATIONS AND SYMBOLS.

= equal to.	∴ therefore.
∥ parallel to.	□′ square feet.
÷ divided by.	□″ square inches.
× multiplied by.	8# read 8 pounds per lineal foot.
+ added to.	[channel bar.
a^2 a multiplied by itself.	I I-beam.
$a > b$: — a greater than b.	T T-iron.
$a < b$: — a less than b.	L angle iron.
$\frac{a}{b}$: — a divided by b.	⊥ deck beam.
	● round section.

1 ton = 2,000 pounds as this is the conventional ton, the legal ton is 2,240 pounds, but is rarely used.
l = the length between supports of any beam or girder or height of any column, always in feet.
b = breadth of any beam or girder, always in inches.
d = depth of any beam or girder, or the least transverse dimension of any column, always in inches.

L = total load uniformly distributed coming on any piece in pounds.
L^{lf} = " " " " per square foot in pounds.
W = concentrated load on any piece in pounds.
s = span of any arch or truss between centres of end pins in feet, or spread of footing courses.
A = area of any section in square inches.
M = maximum bending-moment in inch pounds.
n = distance of centre of gravity of section from either top or bottom edge in inches.
I = moment of inertia, neutral axis through centre of gravity.
R = moment of resistance of section.
r = radius of gyration, in inches.
Sc = safe compressive strain in pounds per square inch.
St = " tensile " " " " " "
Ss = " shearing " " " " " "
S = strain per square inch in extreme fibre.
P_e = upward reaction of support at left-hand end of beam.
P'_f = " " " " " right " " " "
e = distance of centre of gravity of load from left hand of beam.
f = " " " " " " " " right " " "

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of girders, thickness of floor-arch and the cost of the various parts, it will be found that the most economical spacing of columns will be not to exceed 10′ 0″ in one direction, by 11′ 3″ in the other. This is for the usual case; but in order

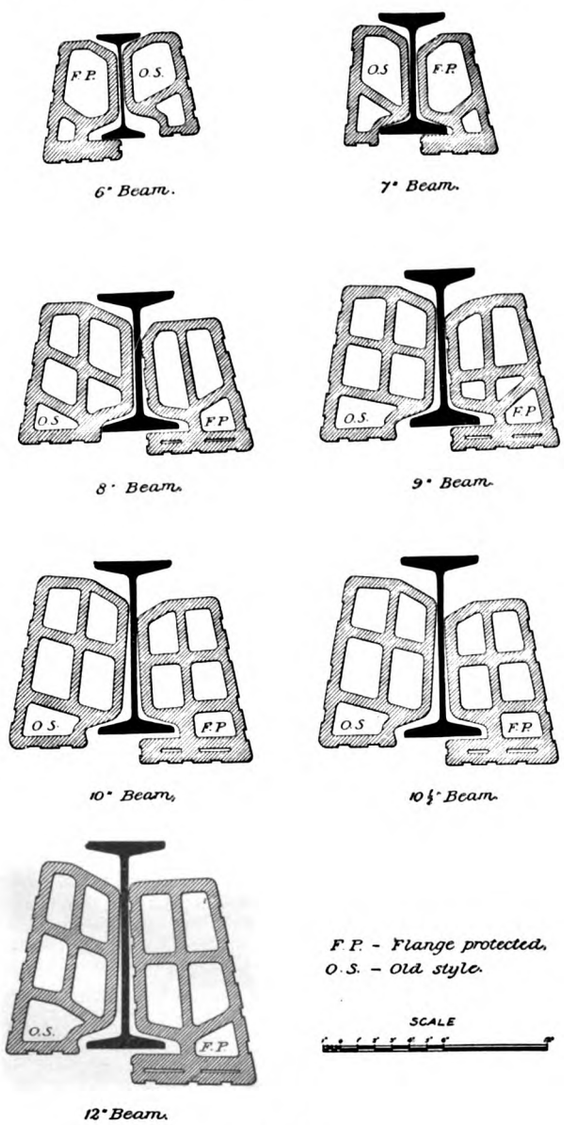


Fig. 125.

to meet the requirements of the shape of the lot, uses of the building and other features which are controlled directly or indirectly by the use, it is necessary that a lay-out should be made for purposes of trial so as to determine that disposition of the columns which for the given case is the best, and for this purpose Table XXXVIII will give the weights of the floor-framing, sizes of the arches necessary to use, the dead-load by reason thereof and other data relative to the floors, and Table XXXIX gives the actual weight of columns for the average height of story of 12′ 6″ and for usual conditions of load as explained in Chapter VII, using Formulas 49, 50 and 51. With this data the architect can compute the total weight of framing required, for any disposition of the floor-beams and columns with relative exactitude, and within 10% of the actual amount.

The weight of columns for floor-areas differing from those given can be determined by a simple proportion; while for a greater number of stories, the architect must determine the weight by successive increments, as heretofore explained.

SECTION I. — FIREPROOF CONSTRUCTION.

§ 324. Filling-in: *Materials:* — *Hollow fire-clay flat arches* are made in two general forms: (*a*) as shown in Figure 125, in which the bearing ribs are horizontal with jointing surfaces at right angles to the line of thrust and continuous, and with the voids of the blocks running parallel with the supporting beams. These blocks are made with two types of skew-backs, one designated "Old Style," and the other with the terra-cotta projecting back underneath the flange of the beams, called the "Flange-protecting Skew-back." These blocks are made with the skew-backs in a number of different forms, some of which are shown in Figure 126. The arches are generally made with whole or half voussiors, which are respectively about 4″ and 8″ long, spilts which are 1″ long, with various sizes of key-blocks, the skew-back blocks remaining always the same. (*b*) End construction in which the voids run at right angles to the beams; the bearing ribs are all vertical, the top and bottom surfaces only being horizontal. Two varieties of these blocks are shown in Figure 127. Very exhaustive tests were made as to the relative strength of the two types of blocks, and it was found that the Lee arch withstood very much higher loads and more severe tests than did the ordinary style of arch. In practical work, however, the excess in strength is without value, while the difficulty of securing satisfactory joints oftentimes leads to trouble, and where this is overcome, as is the case in the Maurer block, the defects incidental to the flat arch are reintroduced, in part.

Porous Terra-cotta: — Or terra-cotta lumber, practically follows the form of fire-clay arches, above described, and is

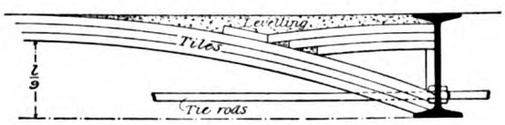


Fig. 128.

made by burning a mixture of clay and sawdust until the sawdust is burned out. Not so generally used as the fire-clay.

Fire-clay Tiles: — See §§ 71, 227 and 228. (Fig. 60.)

Slabs: — Slabs of fire-clay or porous terra-cotta in two forms as shown in Figure 129 are sometimes used. Each block should be clamped to the beam in case the underside is to be plastered on, as the weight of the block is not sufficient to resist the upward thrust when rubbing on the mortar. These blocks should be set in gauged mortar.

Concrete: — Every year sees some new form suggested. None should be used for ordinary building-operations.

Iron and Concrete: — Corrugated-iron sheets bent to an arch form and filled-in over the top with concrete, may be used, but are not recommended. For light floors, corrugated-iron sheets may be laid down, levelled-up with concrete and given a concrete wearing surface with but little loss of time, but this floor will require to be very thoroughly painted in order to avoid very annoying condensation on the under surface. Such a floor will fail when attacked by fire.

§ 325. Proportions: — These can only be determined by computation. The use of Table XXXVIII will facilitate the preliminary studies. The thrust of the floor arch-blocks should be determined by computation, using Formula 45 as described in § 226. Segmental arches are only economical where considerable spans are essential, and where the architectural treatment requires the domed effect. They should be made 6″ thick when of hollow blocks, for spans up to 16′ 0″, with a 12% rise. Guastavino tiles should be made two layers thick for a 3′ 0″ span, with an increase of one layer for each 4′ 0″ of increase of span. In spans of 16′ 0″, the thickness of the crown need not exceed four layers, increasing to the springing line one layer for each three feet, or reinforcing with a light arch as shown in Figure 128.

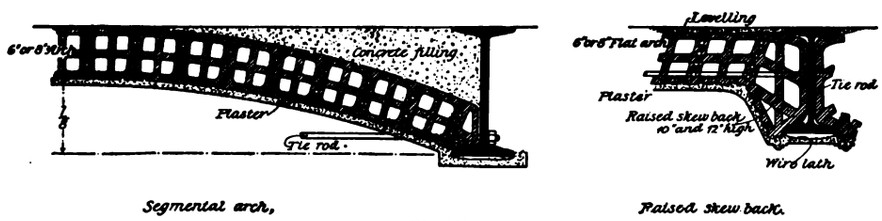


Fig. 126.

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Slabs should be put on T-irons using $3'' \times 12'' \times 24''$ rebated slabs and $2\frac{1}{2}'' \times 2\frac{1}{2}''$ T's 5.4 lbs., or a pair of $2\frac{1}{2}'' \times 1\frac{1}{2}'' \times 1\frac{3}{16}''$ angles rivetted together, back to back, thereby saving in weight 0.8 pounds per lineal foot or 0.4 pounds per square foot. These should be spaced apart 25″, and with 4′ 0″ spans are safe for a concentrated load of 400 pounds or a uniformly distributed load of 75 pounds per square foot. For spans up to 6′ 0″, use blocks of the same size, spaced the same distance apart with $2\frac{1}{2}'' \times 3''$ T's 6 lbs. Where this construction is used for roof-covering, the stems should be covered with a strip, shown in Figure 129, for securing the roof-covering to, and in all cases the flanges of the T's should be protected, using wire-lath to hold the plastering.



Fig. 127.

Suspended Ceilings: — Can be formed by hanging these T's from the beam framing, or more economically by the use of 6″ beams and blocks, making the beam spans about 10′ 0″.

§ 326. Setting: *Flat Arches:* — These should be set in a good Rosendale-cement mortar, No. 3 of Table II. The centering is usually boarding carried by wooden beams, which are, in turn, carried by hooks passing over the steel beams, the length of the hook being adjusted by a wing nut. Voids are left where these hooks pass through the arch, which are subsequently plugged up with mortar and broken pieces of the block. Where the old style skew-back is used, the flange of the beam should be covered with Roebling wire-lath, No. 16 wire, $\frac{1}{4}''$ mesh. Wherever openings are required through the blocks, they can be obtained by punching a hole or leaving out the block up to an area of about 1 square foot, beyond which the opening should be framed out either with

Fig. 129.

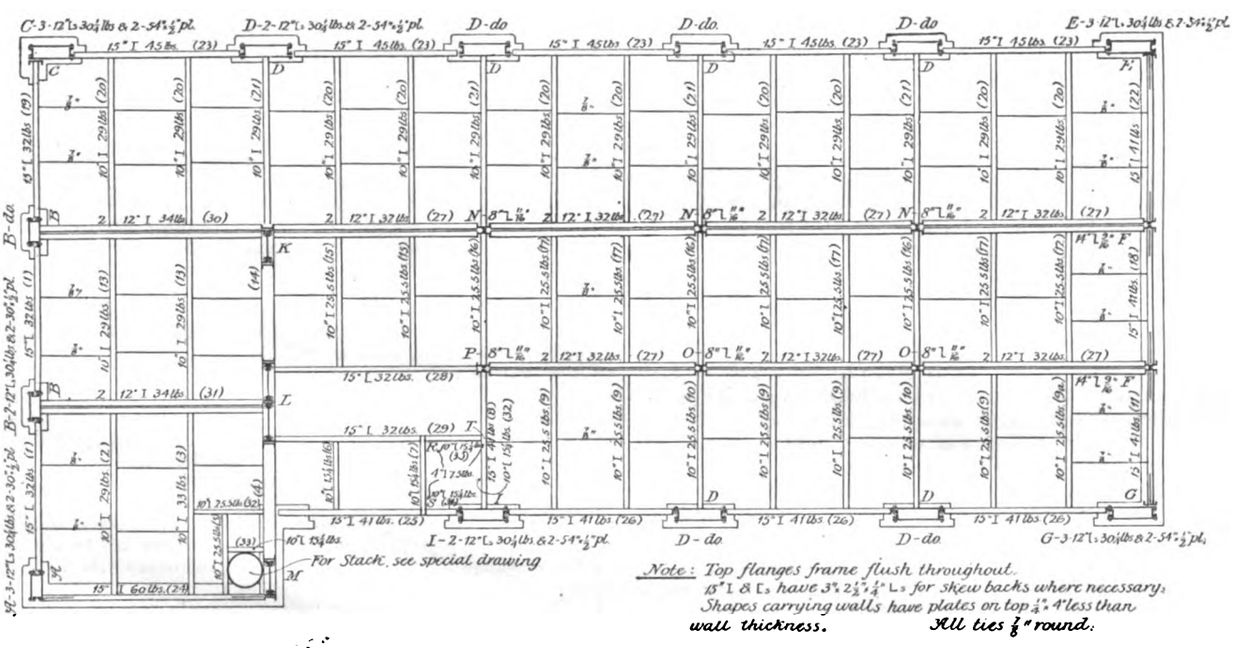


Fig. 130.

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channels of the depth of the beam used, or else with two angles, one at the top and one at the bottom. Where the work is completely planned in advance of construction, the laying of the arches should be immediately followed with a levelling-up of cinder concrete, and the laying of the under floors.

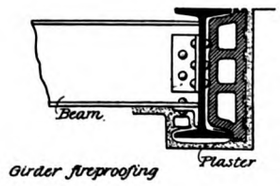


Fig. 131.

Segmental Arches: — These, when made of blocks, are laid in manner similar to that described for the flat arches, except that the centering is made in arch form. For the Guastavino tiles, a staging is built on which the workmen stand, and the centre is a piece of 1¼″ plank cut to the desired form, on which the course of tile being laid is balanced. The first course or layer is usually laid in plaster-of-Paris and the balance in Portland cement. Great care must be exercised to see that the work is not frosted, that no retempered mortar is used, and that the arch is not stepped on until it has had ample time to set, say three days.

§ 327. Protection: — When it is intended to plaster on the underside of arches, care must be exercised on the location of the boiler for the hoisting-plant, so as to prevent staining by the smoke or soot, neither of which can be removed. No foul or muddy water should be permitted to be used in the mixing of the mortar, or to flow over arches, as that will cause a staining through. Care must be exercised that the arches are not loaded until they have had an opportunity to set and are not overloaded at any time. A general rule would be to require that no piles of material other than iron should exceed 4′ 0″ in height.

§ 328. Framing: — A correct plan of every floor should be made wherever there is the slightest change. This plan should show the exact location of the beams and columns of the framing, with the sizes of the beams marked thereon, and designating numbers or letters given to the beams, and designating numbers or letters given to the columns. (Fig. 130.) Even where the floors are exact duplicates, one of the other, the plan should be made, so as to insure the covering of every point. There should also be made at least two sections, and an elevation of each wall, with the floor-lines drawn through, and the framing shown in outline. Arches should start at the wall-line from a skew-back angle or channel supported on the framing or on one course of brick corbelled out 1½″. Tie-rods should be round, spaced from 3′ 0″ upwards on centres, and of proper diameter to take up the thrust.

§ 329. Openings: — All openings should be finished off, using heavy wire-lath, plastered on, or girder fireproofing, as shown in Figure 131. Openings for skylights will be considered in a subsequent chapter.

§ 330. Bottom Surfaces: — The bottom surfaces should generally be plastered. The bottom of fire-clay arches comes from ½″ to ¾″ below the I-beams as shown in Figure 125 [prepared from full-sized sections of beams and arches]. The protection of the bottom flange of the iron beam should be by wire-lath as above noted. False beams, large and heavy cornices and the like, should be carried from the skeleton framing by means of a framing of angles and bars, as shown in Figure 132; the wire-lath on which the plastering is supported being secured to the shapes, or a similar framing can be made of wood at a great saving in cost and without increasing the

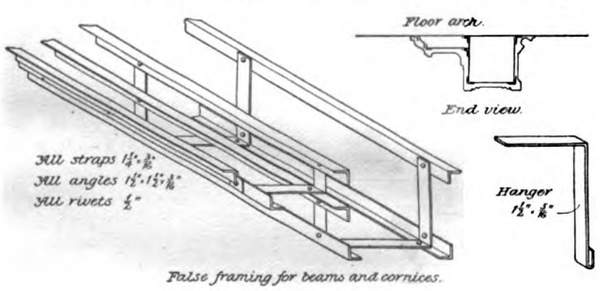


Fig. 132.

fire-risk. All filling of inequalities in the surfaces of the arches, preparatory to plastering, should be done with Rosendale cement and sand mortar. Where it is intended to expose the arches, showing all masonry and construction, the old style of skew-back should be used, and the beam protected with wire-lath and plastered, showing the shape of the flange. The plastering is best done with a hard plaster.

(To be continued.)

ELECTRICAL SCIENCE FOR ARCHITECTS.[1] — III.

THE ELECTRICAL UNITS.

THE strangeness of electrical terms is, perhaps, largely accountable for the lack of knowledge about electrical matters. It is discouraging to meet at the start with "volts," "ampères," "ohms," "watts" and other names and expressions as mysterious as the cabalistic signs on a physician's prescription. But it is only another illustration for Carlyle's "Philosophy of Clothes." Electricity is not the only subject that is looked upon with increased respect and awe because of the peculiar names given to ideas concerning it.

This clothing of the ideas no doubt obscures many simple facts and fails to suggest their semblance to ideas that are familiar, but, in the end, it is an aid to clearness to have the terms distinctive. When once there is clear conception of the fundamental ideas, the electrical nomenclature is found simple and direct and it is an advantage to have specific terms that will not suggest too readily foreign ideas not analogous in all particulars. It is, perhaps, this very directness, the absence of all roundabout terms, that makes most electrical talk seem highly technical. It is encouraging to the uninformed to meet in explanations with "pounds," "feet" and other common quantities, because they are familiar and the most abstruse talk in someway seems to gain clearness when this much is understood. It is, however, largely a question of familiarity, and it is doubtful if our knowledge of the ultimate meaning of pounds and feet is much clearer than our knowledge of volts and ampères.

Analogies are sometimes confusing because they are taken too literally, and the attempt to reconcile the analogous ideas in all particulars will sometimes cause more confusion than if a more abstract conception were attempted at the start. Thus, while it is often helpful, it is not necessary to compare electrical forces and quantities with those that seem to have a more material existence. We may compare them, for instance, with the "pressure of public opinion," "currents of feeling," "resistance to changes." These expressions have a definite meaning to us even though the ideas themselves do not appeal to the five material senses. If there were a way to measure "the pressure of public opinion," we should probably do so, fix upon a unit and give a name to it. But because we cannot do this and yet can measure "electrical pressure," it would seem as if the latter should be not less clearly recognized.

We have these abstract ideas of pressure, resistance and current, and, if they are kept in mind while the names are looked upon as figures of speech rather than as literal definitions, the ideas are of great usefulness.

There is what is termed "electrical-pressure" or electro-motive force. It is a definite force and can be measured. It does not show its effect in quite the same way that water-pressure or steam-pressure does. We do not see it push masses of substance before it, but the abstract idea of a pressure can be applied to it just as we apply it to "pressure of public opinion." It causes certain actions in an electric circuit. When the force is great the action is great, when it is small the action is accordingly small. It agrees with our idea of a pressure and it helps to a clear conception of its nature to think of it as such. Resistance, current and other electrical quantities may be looked at in the same way. It is not necessary to assume that there is an actual flow of something material. It is not known that anything material actually passes through a wire, but it is known that there is a progressive effect along it "like a current" of something and that it is produced by the electro-motive force which acts "like a pressure."

When once it became known that definite electrical forces and quantities existed and gave rise to certain effects, and when these had been named, it remained of course to decide upon units, so that they might be measured and compared. It is hardly necessary to discuss here how or why the different units were made what they are, nor to mention more than three or four most commonly used. As is generally known, the units have been given the names of the physicists who have done most for electrical science. Thus the unit of electro-motive force or electrical-pressure, corresponding to "pounds per square inch" in hydraulics, is called the "*volt*," and the electro-motive force is often spoken of as the "voltage." The unit of current corresponding to "gallons per minute," in hydraulics, is called the "*ampère*." There is no unit of resistance in hydraulics: it is recognized in its effect upon the pressure and is spoken of as being equivalent to so much loss of "head" or "pounds per square inch" pressure. In electrics the resistance may also be recognized in its effect upon the pressure, but it is readily measured as a resistance simply, and is expressed in terms of a unit called the "*ohm*."

These quantities come to have a definite meaning as they become familiar through use. One mentally forms a rough idea of the number of units of electro-motive force, current and resistance in an electric circuit, from the actions that take place, from the visible

[1] Continued from No. 948, page 90.

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manifestations of the electrical energy. By continued experience one gradually gets an idea of the relative resistances of conductors of different sizes and materials: an idea is formed of the amount of current that is necessary to heat them or to cause the different magnetic effects, and of the amount of electro-motive force necessary to force the different currents through a certain length of conductor.

There is nothing in an object to tell of its hardness or softness except its similarity in various ways to other objects that we have felt. There is nothing to show the temperature of a body except the effects that are seen when the heat energy is changed to other forms. But continued experience teaches us to appreciate all the slight changes and small actions. Electrical forces and quantities become familiar and seem real, by the same process, and with experience one intuitively forms rough judgments just as one does of weight or temperature.

It will, perhaps, help to form an idea of a few of the electrical quantities, if their magnitude in some common instances are mentioned:

The electro-motive force of a voltaic cell, such as is used in telegraph and telephone work or for ringing electric bells, is from 1 to 2 volts.

The pressure at the terminals of an incandescent lamp is usually either 50 or 110 volts.

The pressure used in electric-railway work is nearly always 500 volts.

The current through an incandescent-lamp when made for a pressure of 50 volts is about 1 ampère; when made for a pressure of 110 volts the current is about ½ ampère.

The current through an arc-lamp when it is of 2,000 nominal candle-power, is about 10 ampères.

The resistance of a copper-wire .01 inch in diameter and 10 feet long is almost exactly 1 ohm.

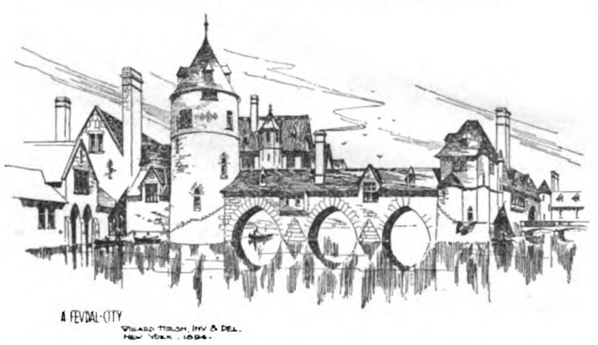
The resistance of a German-silver wire .01 inch in diameter and 1,000 feet long is about 1,500 ohms.

A copper-wire 0.5 inch in diameter and a mile long has a resistance of about 0.2 ohms. The same wire 10 miles long would have a resistance of 2 ohms, the resistance being proportional to the length. If the same wire were one-half the diameter it would have four times the resistance, since the resistance is inversely proportional to the sectional area and consequently inversely proportional to the square of the diameter.

RUSSELL ROBB.

[To be continued.]

SHUMAN'S PROCESS AND APPARATUS FOR EMBEDDING WIRE-NETTING IN GLASS.[1]



THE Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanic Arts, by its Committee on Science and the Arts, investigating Shuman's process and apparatus for embedding wire-netting in glass, finds as follows:

The object of this invention is to strengthen, or reinforce, sheets of glass of various dimensions intended to be used for roof-lights, partitions, vault and pavement lights, port and deck lights, etc., by inserting a metallic-netting into the body of the glass sheets at the time they are rolled, with the view of protecting the glass against fracture and of preventing fragments of fractured sheets from detaching themselves in case of accident.

The present mode of protecting glass-skylights is to suspend copper-wire netting immediately beneath the glass, the wire being fastened to a framework holding the glass. In situations exposed to smoke, corroding-gases and other destructive influences, as in railway-stations, chemical works, etc., this practice is attended with serious objections, for the reason that, in such situations, even copper and brass wire will become corroded and will then be worthless as a protection against the fall of large fragments of glass, should the skylights become broken.

The enormous extent to which wire-netting is used thus to protect skylights was strikingly illustrated at the late World's Columbian Exhibition in Chicago, where 1,045,000 square feet of wire-netting were placed under the glass roofs of four of the main exhibition buildings.

The use of wire-netting in such a manner that it cannot be corroded and, at the same time, will reinforce and strengthen the glass (which, in the old practice, the netting does not do), would obviously be a great step in advance and one which should commend itself to architects and engineers, and the advantages of embedding the wire in the glass itself to accomplish these objects are so manifest that further comment would seem unnecessary.

In examining the prior state of the art of producing sheets of glass with metallic enclosures for the purpose of strengthening and guarding the same, the following references, bearing more or less directly on the subject, have been found and consulted.

The first invention, showing wire-netting embedded in glass, is the British patent, No. 1,528, of 1855, granted to Newton for fire and burglar proof glass. This patent describes the depositing of a quantity of molten-glass into a mould, then placing on the glass a sheet of wire-gauze, then placing upon the wire another quantity of molten-glass, and finally pressing the mass into a sheet. The wire is prevented from projecting beyond the glass by constructing the mould in two parts and mounting the wire between the parts; it is claimed that several sheets of wire-cloth can be thus introduced into the glass. . . .

The Shuman patents, Nos. 483,020 and 483,021, of September 20, 1892, as far as can be found, are the only patents granted in the United States for embedding wire-netting in glass.

The first attempts to put the idea into practice appear to have been made in England, some twenty years ago, by Thaddeus Hyatt, whose British patent, No. 1,482 of 1871, is referred to above, and concerning which we give the following additional details:

A section of wire-netting is securely clamped in a frame of cast-iron of a thickness equal to that of the glass-sheet to be made. This frame is then laid upon a flat table, and sufficient glass to form a sheet poured into it. By means of an hydraulic press, part of the glass is forced through the meshes with the view of getting the glass on both sides of the netting; or, in other words, placing the netting as near as possible in the centre of the glass-sheet. While this seems very simple in theory, Hyatt appears to have encountered great difficulty in forcing the glass through the meshes when a fine netting was used. To obviate this difficulty, a square or round hole was made in the centre of the section of wire-netting in order to facilitate the flow of glass underneath.

The netting was thus necessarily subjected to a severe strain in forcing the glass through the meshes, and, since the metal becomes red hot by its contact with the molten glass, it will evidently stretch and sag when pressure is applied to it, thus making it impossible to keep the netting even approximately in the centre of the glass sheet. Another objection to this method is that the dimensions of the glass sheet are limited to the size of the face of the plunger of the hydraulic-press. Hyatt's process was apparently found to be impracticable, and, so far as can be determined, his product never became a commercial commodity. . . .

By the Shuman process the wire-netting is inserted into the glass whilst a sheet is being rolled, the wire being heated, just before its incorporation, to a temperature near the melting-point of glass. The wire-netting thus incorporated with the glass forms part of the sheet itself and it cannot by any means, short of violence, be detached or removed therefrom. Of course, such a sheet may become cracked and portions detached from and expose the wire; but even in such a case, there are so many points of attachment that it would hardly be probable that sufficient corrosion could take place to seriously weaken the wire and damage the sheet, no matter how many fine cracks it might contain through which the corrosive influences could work their way to attack the metal.

The inventions of Shuman form the subject of two letters-patent of the United States, one covering the details of the machine, and the other the features of the process. In the following description, reference will be made to both of these specifications without special distinction, as it will be convenient to regard them for the purpose of this investigation as a single invention. . . .

The table upon which the glass is rolled is arranged so that it may be heated from below by large gas-jets, prior to beginning work. The table is made preferably of cast-iron, and is provided on each side with ribs of sufficient height to allow for the rolling of the glass, and on the outer edges are rails upon which the rolls travel. On each side are rails, supporting the carriage before and after its travel. These rails are mounted in any suitable manner and are in line with the rails of the table.

The carriage is provided with four rolls, a front smoothing-roll, a ribbed-roll and two following smoothing-rolls. It is moved across the table by power transmitted by means of a sprocket-wheel and link belt. The front roll is intended to smooth out the molten glass after it is poured out upon the table and prepares it for the reception of the wire-netting.

An inclined chute, for feeding the wire-netting to the glass as this is spread by the front roll, is shown in connection with the carriage, arranged at the proper angle, and has a trigger, or other stop, at its lower end to detain the sheet of wire-netting placed thereon until the proper time to discharge it upon the glass. The sheet of wire-netting is preferably heated to the proper degree, so that it will not chill the glass when it is placed thereon. Directly back of the chute is a roll independently mounted in the carriage and having on its periphery a series of annular ribs, so arranged in reference to the table as to press the wire-netting into the molten-glass. The ribs may be so arranged that although all the wire is incorporated in the molten glass some portions thereof will be pressed more

[1] Abstract from the report of the Committee on Science and the Arts of the Franklin Institute and published in the *Journal* of the Society.

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deeply than others, thus corrugating the wire within the glass, if this be desired.

A smoothing-roll directly behind the ribbed-roll then passes over the glass and closes up the openings made by the ribbed-roll and wire, completing the rolling of the glass. A second smoothing-roll is preferably employed, in order to correct the tendency of the rolled sheet, while still in the plastic state, to curl up over the first rear smoothing-roll.

The finished glass is then removed and placed in an annealing-furnace. After the glass has been annealed, any glass or wire projecting over the edges of the sheet is cut off, after which the glass is ready for the market. The wire is preferably cut to the proper size prior to its application to the glass. The three smoothing-rolls support the carriage, the ribbed-roll being so mounted therein that it is free to rise or fall independently of the carriage. Thus by raising this roll when the carriage is returning it will be clear of the glass. In order properly to handle the glass, the smoothing-rolls are made hollow, and the heads are perforated to admit a gas-pipe with jets for heating the rolls before beginning work. The rolls when thus brought to the proper temperature will not chill the glass during the process of rolling.

In operating the process a sufficient quantity of glass is poured upon the table at a point immediately in front of the first roll. As the carriage is moved forward, the roll smooths out the molten-glass to the proper thickness, after which the wire-netting is delivered upon the molten glass and pressed into it by the following ribbed-roll. The next following smoothing-roll closes the openings and corrugations made by the netting and ribbed-roll. By this means a sheet of glass is produced with strips of wire or a sheet of wire-netting embedded therein. By having, at certain distances, a series of annular grooves upon the ribbed-roll, it is possible to corrugate the wire within the sheet. The heated wire being pliable, it will yield only at the points where it receives pressure, and may, accordingly, be made to follow a waving, or any other desired course in the sheet, as the outline of the periphery of the ribbed-roll shall determine. Thus the wire is, so to speak, woven within the glass in such a manner as to tie both wire and glass together.

The glass, after it has been rolled, is carefully annealed in a furnace of the usual construction. The wire embedded in the glass not only strengthens the sheet, but also prevents the particles of glass from breaking entirely away from the main sheet, while, on the other hand, the glass protects the wire against corrosion.

From the foregoing abstract, it will appear that the radically novel feature of Shuman's apparatus is the ribbed or grooved roll, by which the wire-netting is pressed to a pre-determined depth into the glass whilst the sheet is being rolled, and, at the same time, is permanently fixed in position by the following smoothing-rolls; and the scope of the process may be defined as rolling out a sheet of glass, pressing into it a metallic fabric, and finishing the sheet by pressure of a heavy roll or rolls, whereby the metallic fabric is permanently embedded therein, these steps constituting practically a single operation.

The pressure of the rolls in the later machines is about fifty pounds to the square inch; the distance from centre to centre of the ribs or grooves in the ribbed-roll is one inch. It has been found that with grooves of this size, any wire-mesh between one-fourth inch and three inches can readily be embedded. These sizes of mesh represent the extremes of the sizes employed. A smaller mesh would require a groove of different size.

The average temperature of the fused glass is about 3,000° Fahrenheit. It is stated that the glass may be rolled at about 2,200° Fahrenheit, although the higher temperature is evidently the better one.

The inventions of Mr. Shuman are in practical operation on an extensive scale at the works of the American Wire Glass Manufacturing Company, at Tacony, Philadelphia.

The works cover an area of one-and-one-half acres, and the plant at present consists of one main building, 300′ x 100′, and two auxiliary buildings, each 20′ x 150′. The glass melting-plant is an eight-pot Siemens's regenerative furnace of the latest design and capable of melting ten tons of glass per day. The fuel used is gaseous, furnished by three Wellman gas-producers. There are twelve annealing-ovens of the Belgian type for tempering the glass sheets immediately after the wire has been inserted, and to these the glass is carried in a tray. These annealing-ovens are heated by the Aërated Fuel Company's system, using crude petroleum.

The steam-plant consists of one fifty horse-power Babcock and Willcox, and one fifty horse-power upright, boiler. All mixing and handling of glass is done by machinery. There are three sizes of rolling-machines at present installed; two, capable of rolling sheets up to 24″ x 84″; two, capable of rolling up to 30″ x 84″, and one machine capable of producing sheets as large as 54″ x 144″.

Machinery has been introduced for handling the product wherever it could advantageously be applied. Thus, all the waste material is removed by tramways, and all cars and wagons are loaded from overhead tracks. The waste ends and imperfect sheets are utilized by separating the glass from the wire by means of special bending-rolls. The glass broken off is returned to the furnace, and the wire, wherever practicable, utilized for other sheets. With the experience now gained in the operation of the plant, it is stated that the percentage of defective sheets made is so small that it does not enter as a factor in the cost of production.

The rapidity with which sheets are made varies with the thickness. With three-sixteenths inch, the time of rolling is eighteen seconds; with one-fourth inch, twenty-five seconds; with three-eighths inch and over, thirty-five seconds. The capacity of the plant is 5,000 square feet per day of all sizes, and it is stated that the demand for the product has been large enough to keep the works fully occupied.

With its present facilities, which, it has been stated, will be extended as the requirements of business demand, the company is now engaged in the manufacture of wired-glass sheets of any required dimensions up to 4′ x 10′ and from three-sixteenths inch to one inch in thickness. It is manifest that there must be a limit, beyond which it would not be prudent to increase the dimensions of sheets on account of their weight and the risk of cracking in handling and transportation. The usual dimensions for skylight and roofing glass range from 10″ x 20″ to 30″ x 84″. Sheets larger than 48″ x 144″, therefore, will rarely be called for.

The objection that has been urged against the process — the difficulty of cutting the sheets to desired dimensions — is a real one, but to a great extent has been overcome. In the operation of cutting, the sheets are first scratched with the diamond, then broken across the cut, when the ductility of the embedded wire readily permits, by bending slightly to and fro, a sufficient separation of the edges of the cut to allow a thin-bladed saw to be inserted, by which the wires are cut through with comparative ease. In nearly all cases, however, the demands of the trade are for standard sizes, which require no cutting beyond that necessary to trim the edges. . . .

Another point of interest which is worthy of notice, in connection with the operative features of the Shuman process, is the preliminary preparation of the wire for the production of the higher grades of wired-glass. This consists in, first, removing the oil or grease from the wire by treatment with a cheap solvent (such as benzine), then passing the wire under a swiftly revolving roll, provided with bristles, and finally beneath flannel buffing-wheels, whereby the wire is thoroughly cleansed and polished. For the best grades of wired-glass, a specially annealed steel wire is used, which, after the cleansing treatment, presents a white and brilliant surface.

The following claims of merit, made on behalf of the new product, appear to be substantiated, viz: When used for the skylights in railway sheds, the much greater strength of wired-glass permits the use of thinner and larger sheets, thus reducing the weights in the roof. It is hail-proof, and proof against vibration. The copper wire-netting which is now required beneath such skylights, to protect persons below from injury by the accidental falling out of glass, may be dispensed with, thus saving not only the cost of the guard, but also the cost of renewing such netting when weakened by corrosion. The increased strength of wired-glass will enable it to support with safety great weights of snow, which occasionally prove destructive to skylights of the ordinary kind; and, even should it become cracked by reason of rough usage or by accident, the tension of the wires will hold the fractured portions together, and the efficiency of the sheet will not be notably impaired.

Worthy of mention, also, is the fact that the common skylight guarded with wire tacked on beneath is so difficult to clean that this important item is practically neglected, with the result that the glass in time becomes greatly obscured by accumulation of soot and dirt.

It is probable that there would be much less likelihood of the occurrence of fatal or minor accidents caused by persons falling through skylights of wired-glass when it is properly set in its frame; also, stones and heavy articles falling on such glass will often be arrested; and, on account of the time and trouble entailed in cutting through it with the diamond and severing the wires, it would interpose a much more serious obstacle to thieves, than the plain, unguarded glass. These qualities commend the new product for use in show-windows where articles of value are exposed. It is proposed for windows in warehouses and stables, machine-shops, railroad-shops, and it is also suggested as advantageous for partitions in buildings. For deck, port and cabin lights in vessels, the same reasons should ensure its serviceability.

Finally, it is suggested that in the form of large sheets of extra thickness, strengthened by one or more enclosures of wire-netting, and properly supported in an iron frame, wired-glass would afford an advantageous substitute for the round bull's-eye and other small patterns at present largely used for pavement and vault lights. The wired-glass could not only be made sufficiently strong for such service, but would also admit much more light per square foot of area than the forms of lights in common use.

These claims appear to be well founded.

The members of the committee of investigation, having had the opportunity of examining this invention in the course of its practical development on the commercial scale at the Tacony Works, are fully satisfied that the mechanical elements of the problem have been admirably worked out; that the present mode of manufacture is simple, efficient and rapid; and that the quality of the product is good. In conclusion, they find that the process and machine of Mr. Shuman, not only represent a marked advance upon all previous efforts in the class of inventions to which they relate, but also that they meet for the first time in this branch of the arts, the requirements of a practically operative method and means of manufacture.

For the reasons herein stated, and because of the undoubted advantages of wired-glass for those uses for which it is adapted, the Institute recommends the award to the inventor, Frank Shuman, of

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the John Scott Legacy Premium and Medal, for his machine and process for producing wired-glass.

JOSEPH M. WILSON, *President.*
WM. H. WAHL, *Secretary.*

Approved, November 1, 1893.
H. R. HEYL,
Chairman of the Committee on Science and the Arts.

ENAMELLED BRICKS.

SOME thirty years ago the Farnley Iron Company and one of its neighbors in business at, or near, Leeds, England, finding that the fire-clay found in connection with the coal-seams in that district was particularly suitable for allowing an enamel surface, began the manufacture of glazed-brick. For some years after the trade was started the brick made were very inferior compared with those of the present day, the best brick of that day not being at all equal to what are sold as second quality now. Notwithstanding this, the brick found immediate sale with architects, especially in London, where they were used partly for sanitary reasons (the glazed surface being washable and non-absorbent) and partly for light afforded in narrow alleys and courts. As the quality of the bricks improved with the experience of the makers, the demand still further increased, and they are now used in large quantities in all English cities. It is estimated approximately that the total output capacity of the Leeds district is about 4,000,000 to 5,000,000 per week. Of these numbers not more than sixty per cent can be reckoned on as first quality, and thirty per cent second quality; the remainder, as thirds, are available only as building-brick. These thirds are valuable where strength is required; the superior clay and hard burning make them of high value, because of their resistance to crushing loads.

It is worthy of note here that in placing enamelled-brick where they are to be subjected to heavy loads, care must be used in setting, that the superincumbent force does not press on the outer edge of the brick, as the enamel will give way if more than its share of the load is imposed upon it.

Probably about one-sixth of the product of the Leeds factories is shipped and used in America, where they may be said to be the standard for good, serviceable enamelled-brick, and the excellent quality to which they have attained must be equalled by our American manufacturers before they can justly claim to have first-quality glazed-brick.

It is a pleasure to be able to state that at this time there are, at least, two American manufacturers who have nearly attained to the excellence of the best English makers; in fact, they do equal them in the durability of this product, their success in getting clays and glazes to fuse being fully up to the English; and the only difference in the American and English brick is that our manufacturers have thus far failed in finding a clay with all the necessary qualities that will, after burning, have a surface as smooth as is the product of our English friends. The only American manufacturers who have thus far succeeded in making a thoroughly good and merchantable glazed-brick from the standpoint of the English standard are the Griffen Enamelled Brick Company, of Oaks, Pa., and Sayer & Fisher Company, of New York. The experience of our American, as well as the English manufacturers, in getting the manufacture of glazed-brick started on a successful basis, has been fraught with many sad experiences, and with them, as with the makers of other kinds of brick, the working of clays and enamels has been "eye-openers," and in all cases success has only been attained at a great cost in money and vexation of spirit. — *G. B. Engle, Jr., before the National Brick Manufacturers' Association of the United States of America.*

ALBERT MOORE'S WORKS.



"Beads," by Albert Moore.

"A COLLECTION of pictures and studies by the late Mr. Albert Moore brought together and exhibited as a tribute of respect to the memory of that great artist, whose loss we deplore, and with a view of giving some idea how great this loss is to English art." Such is the somewhat uncomfortably composed heading to the list of Albert Moore's works, now on view at the Grafton Gallery, London; and doubtless, among his many admirers upon your side of the globe, some may be interested in a little run, vicariously, through the room.

It is always trying for an artist's reputation to have his works thus assembled together. Jostled in the ordinary way against other pictures, a painter has much to lament when he sees how his own works "swear" at their neighbors, or how his neighbors' work reviles his own; but for all that, it is possibly less damaging than placing his individual schemes of tone and color side by side, with no relief or variety. A painter must be a strong worker to escape monotony under these circumstances; and it is more than doubtful whether Albert Moore was "great artist" enough to escape failure. We have had a Millais collection of late years, besides assemblages of the work of Rosetti, Burne-Jones, Gainsborough, Reynolds and Watts; and of these, it may not be unjust to say, that Millais and Reynolds were the two painters who were completely free from convention, monotony or weakness — qualities to be found, more or less, in all the other masters' work.

Therefore, it is not surprising if Albert Moore's pictures strike one as somewhat weak and *fade*. That he was an able artist, a thousand times superior to many of the Academicians who kept him out of their society, is undeniable; but possibly the term "*artiste de talent*," as the French say under certain circumstances, would be a more suitable one than "great." His figures are eminently graceful, the lines are pleasing, and sometimes there is poetry and sentiment in the composition: color, too, occasionally, but more often not. His flesh is dead and wooden, his stuffs just anything you like; indeed, there is no attempt at realism of any sort. Draperies appear to be tempest-blown, but there is no wind to move them. Shadows denote a sun, but it does not shine. Moonlight, sunlight, storm and calm, all are of the same effect; poetic, perhaps, but it is not the poetry of nature. The little studies are charming and the old "Quartett," painted years ago, remains unsurpassed by any of the later work — it seems an echo of an elegant fresh coin or gem. But there is a dreariness about most of the pictures, a want of light, and sun and life; a feeling that all spontaneity has been sacrificed to infinite labor and pruning, a want of the emotional element and a terrible lack of color; still, there is, withall, a conscientiousness, a purity, a desire to deliver a message which should only work for good, or an originality within certain limits (rather, perhaps, a Renaissance of Greek feeling), which ought to have been rewarded by admittance into the honored ranks of the Academy — if it be an honor to pass that threshold.

That it is quite possible to combine poetry with nature is proved by Mr. G. Hitchcock's "S. Geneviève" — an exquisite piece of color harmony. It is instinct with life and poetic feeling; so, too, M. Roll's "Flight into Egypt." These pictures form two more links in the chain of modern religious art: strong, both in feeling and technical qualities, S. Geneviève is standing amidst her sheep in a mass of high grass and wild flowers, clad in a blue gown, the symbol of purity, and a simple flannel cape; that is all the color, a lovely harmony of blue and green. In M. Roll's work we see a workman with his wife plodding over the rough ground; the Virgin bends over her babe which she is caressing. There is no effort at reproducing any land between Judea and Egypt; this piece of ground might be in France, England or Italy. There is no distinctive dress, no effect of, or straining at, holiness; it might be named "Evening," or "After the Day's Work." Just a gleam of a nimbus is all that tells the tale; and yet it is immeasurably more spiritual than three-fourths of the religious pictures of the old masters. It is a pity that the hangers have condemned the picture to a dark spot in the vestibule.

Professor von Uhde is not at his best in the "Sermon on the Mount." He has caught the intensely religious feeling of the Bavarian peasants, but they are unnecessarily ugly; and the painting is coarse and commonplace.

The sunny meadows of M. Claus, and the flowers of M. Fantin Latour are old friends in a new dress; but Professor Zügel's "Sentinel," is a new and fine acquisition. A glowing sunlit down, and some sleepy sheep are guarded by a large white dog who looks watchfully at the spectator. The anxiety lest evil should approach his charge during his master's absence, and the importance of the task allotted to him, are most powerfully depicted upon that dog's face: one would like to know and honor him as a dear friend.

Some of the Glasgow school's eccentricities are raging upon the walls, feeble imitations of the early French Impressionists; and it seems a pity that after all these years, Manet should be imitated, and his faults exaggerated, by those who ought to have profited by his failures. In France, the lesson taught by Manet was all learned and has been applied equally well by the later school; at Glasgow, they seem to have gone back twenty years to produce works, the principal aim of which appears to be to caricature a chess-board.

M. Rodin exhibits some black-and-white sketches of figures dashed in with a most masterly touch; and, as for M. Raffaelli's little etchings, they are simply and quaintly charming. PENGUIN.

FOR EXTENSION OF WESTMINSTER ABBEY. — Yates Thompson, formerly owner of the *Pall Mall Gazette*, has offered £38,000 with which to add to Westminster Abbey a large chapel in which future memorials and monuments may be erected. The Government has deferred accepting the offer, pending the decision upon three schemes already suggested for the extension for the abbey.

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ILLUSTRATIONS

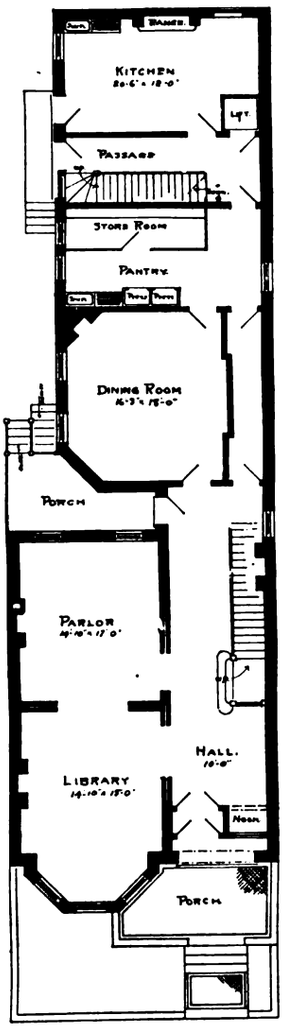
[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

NORTHEAST ANNEX OF THE FINE ARTS BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. CHARLES B. ATWOOD, ARCHITECT.

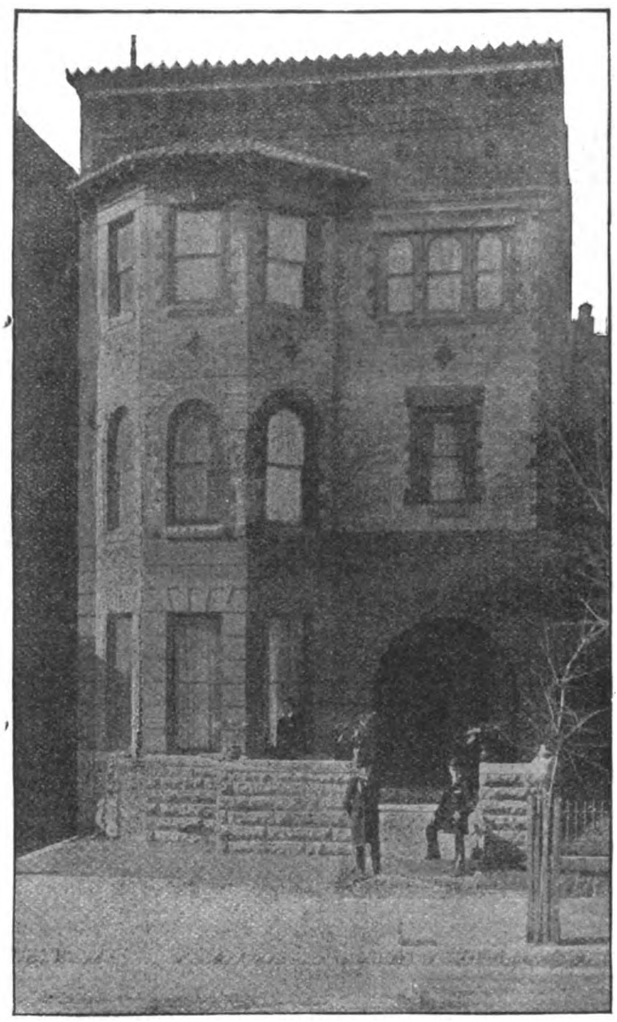
[Gelatine Print issued with the International and Imperial Editions only.]

HOUSE OF HENRY LEE VALENTINE, ESQ., RICHMOND, VA. MR. M. J. DIMMOCK, ARCHITECT, RICHMOND, VA.

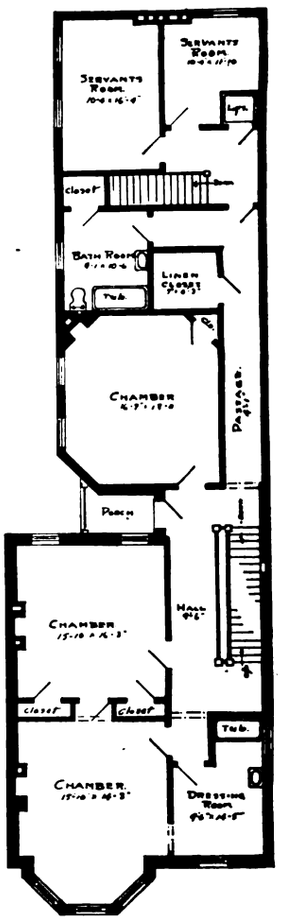
THE materials used in construction are brown stone, red brick and old-gold brick in combination. The house is just completed and cost, complete, $12,000.



FIRST FLOOR.



House of Mr. Henry Lee Valentine, Esq., Richmond, Va.



SECOND FLOOR

HOUSE OF SENOR SARACIBAR, ARCHITECT, SALAMANCA, SPAIN.

IN the broad and aristocratic district of Salamanca, and at the end of Claudio Coello Street, has been erected an elegant and artistic house, called "Villa Bilbao," which was designed for his own occupancy by Señor Julius de Saracibar, a well-known Spanish architect, who has passed the best part of his life erecting and embellishing the dwellings of many other persons, and has at last been able to construct his own, being able in it to display his genius and his skill as a constructor.

This residence occupies an area of about 8,000 square feet. It is difficult to distribute this space with more dexterity, for on this lot the villa has been built with an ample and marbled exterior *escalinata*, garden, small lake, grotto, kiosks, stables, departments for straw, a greenhouse and other accessories, all arranged so that nothing becomes a hindrance — everything is seen and everything is isolated.

In this abode, all the rooms are large, with high ceilings, profusely lighted and ventilated, with great economy of the land. The access to the property is from Claudio Coello Street, by a large and wide entrance between pillars decorated with allegorical details dedicated to the unconquerable city of Bilbao and to its famous siege.

The ground-floor has its access at the level of the garden, but the floor is raised more than a metre above this level, profiting advantageously by the slope of the site and freeing the rooms from the humidity of the adjacent plantations; it contains the billiard-room, bath-room, kitchen, pantries, larders, lavatories and servants' rooms.

The first floor is approached by a commodious staircase, and from the exterior by the wide *escalinata* that we have already mentioned: this floor contains Señor Saracibar's studio, the large drawing-room, the dining-room with a charming "rotunda" on the side of the garden, a hall and the beautiful staircase that goes to the second floor; in the latter are the bed and other rooms, all with direct light and with all the best conditions of sanitary and commodious arrangements; rooms for servants and for domestic services are provided in the roof, and a pleasant and isolated study-room is at the top of the turret.

We will not fatigue our readers with an exact account of the magnificence and elegance of the ornamentation of these rooms. But we think it is our duty to attest that everything that is seen in this residence, from the ironwork of the doors to the carved furniture, from the curtain to the enormous chimney, the mosaic of the floors and the painted ceilings, everything has been made after the designs and under the direction of the proprietor, and everything shows the seal of the artist. The first impression makes you know that this is the habitation of an artist that loves the art for the art. The treatment of the principal block of this building that advances as far as the line of the street, seems rather florid, and some people have qualified it as overloaded.

The house is divided into three sections: the first vigorous and light; the other with its ample triple window, by which enters abundant light for drawing (for it lights the studio), is severely decorated with appropriate elements so as to facilitate the delicate and prudent transition to the upper part — the richest portion. We all know that the sculptured figure always has a great value as a decorative element, and placed as these caryatides are, they give a great importance to this part of the building, that some judge excessive.

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The four fine arts have between themselves ties of union that are common. Architecture the same as music must seek for the harmony of its parts with the whole, the perfect accord of its elements. As painting studies the effect of light and shade perspective, the intonation of color; as sculpture searches for grandeur of line and has to accuse the structure, the anatomy of the body that it models, so Señor Saracibar has rendered homage to the four sisters, receiving and giving them a lodging in his own house. In these caryatides there is originality and taste; they are neither the *canephoras* of the Villa Albani, nor the caryatides of the Athenian Pandrosium; they are his, and nothing more.

The pediment is crowned by a colossal head of the "Genius of Art." In the tympanum are sculptured the emblems of architecture, with branches of laurel and oak round them, and the heraldic shield of Señor Saracibar is suspended in a prominent place of the façade.

Forming part of this block of the building, follow at its left side and parallel to the public road other two blocks in the centre of which is the entrance door, and above on the same axis, a window; in front of the door there is a small terrace to which leads the broad *escalinata* of which the balustrade is in the line of the street, adorned with openwork metal and vases in a very good taste.

The other block on the left side is formed by the square tower so characteristic in Spanish construction. There was in it a problem of no easy solution; in its large massiveness there were larger surfaces of the building that had to be decorated with sobriety, but in harmony with the rest of the work. A colossal bust and a statue have been enough to decide the difficulty with dexterity. The first is that of Michael Angelo Buonarotti, and the second the Venus of the Island of Melos.

The tower terminates in a belvedere and in the middle of the cornice is a colossal bust of Apollo, the god who presides over the fine arts.

In the north façade, which is not covered and is beaten by the north wind, he has taken great care to furnish a gap in each floor; these gaps are made to ventilate all the building. This façade, that naturally would have had a frigid appearance, and would have been without movement, now appears agreeable and harmonious through the construction of a very large central recess, decorated with strong pilasters and an arch, that facilitates the issue of the fumes of four chimneys, converting the whole into a grandiose *motif* that constitutes the ornamentation of the façade.

The site is limited on the left side by a large, but not very high party-wall. Señor Saracibar thought, from the first, of covering the cold and ugly appearance of this wall, but he did not employ the common and vulgar lattice to cover its nakedness — far from that — he spent much time and money in reproducing, with all its details, the famous frontispiece of the Egyptian speos of Isamboul, dedicated to the goddess "Hathor."

At the junction of the party-wall with the front wall of the block, he has erected a spacious grotto, in which artificial stalagmites support the stalactitic vault of irregular shape, and here is placed a plate-glass aquarium, the seats about it being formed with Persian capitals and one of the gigantic idols of Bamiyan. He has also constructed a little mountain, erecting on it a lighthouse which at night with its bright rays serves as a lamp in that part of the garden.

What is particularly worthy of notice in this house is the economy of the materials of construction and the employment of one very seldom used in this country. The architect has striven to give the walls the precise thickness that may correspond to the necessary condition of stability and resistance, and where walls are suppressed he replaces them with iron columns or pilasters, properly spaced; this allows him to use thin walls, and to leave others open without complicating the construction; he abandons altogether all vertical wooden beams, and so economizes all the space he can.

The material of which we have spoken as foreign is the "*Sable mortier coloré*," made by M. Charles Stocker, Paris, Quai de l'Oise No. 29. It is an artificial stone of very good quality, that can be kneaded easily and is furnished ground or in powder so that it can be moulded, the same as gypsum; it acquires later a great hardness. The walls are dressed with it, and mouldings, statues, adornments and all sorts of high and low reliefs can also be made with it. Employing this stone-mortar, it is unnecessary to paint the walls, and the color that it acquires is more uniform than can be secured with any sort of stone. All the walls of the façades and all the work of sculpture of this villa have been made with it. * * *

MADRID, October, 1893.

ROOD-SCREEN IN ST. PETER'S CHURCH, MORRISTOWN, N. J. MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

THIS drawing, by Mr. Frank A. Hays of Philadelphia, was hung at the late exhibition of the Architectural League in New York. The ironwork, itself, was manufactured by John Williams of New York.

THE ROBERT F. BALLANTINE GYMNASIUM AND ARMORY. RUTGERS COLLEGE, NEW BRUNSWICK, N. J. MR. CHARLES ALLING GIFFORD, ARCHITECT, NEW YORK, N. Y.

THE building was a gift to Rutgers College, by Robert F. Ballantine, Esq., of Newark, N. J. The materials are brick and stone. The gymnasium proper is 60′ x 100′ in size; while the main or Administration Building in front measures 82′ x 37′. The building is complete in every way, containing bowling-alleys, a large swimming-tank, a ball-cage, a running-track and all necessary accommodations for lockers and equipments, instructors'-offices, measuring-rooms and committees'-rooms.

A COUNTRY CLUB-HOUSE ON LONG ISLAND, N. Y. MESSRS. DOUGLAS SMYTH AND A. R. MCILVAINE, ARCHITECTS, NEW YORK, N. Y.

[Additional Illustrations in the International Edition.]

ENTRANCE TO THE GERMAN VILLAGE, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL.
[Gelatine Print.]

NORTHWEST ANNEX TO THE FINE ARTS BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. CHARLES B. ATWOOD, ARCHITECT.
[Gelatine Print.

VICTORIA ASSIZE COURTS, BIRMINGHAM, ENG.

A GENERAL view of the Birmingham Courts was published lately in this journal. We now show on a larger scale the central block of a building that has received general commendation from the Judges who have presided in it.

CHURCH OF THE ENGLISH MARTYRS, STREATHAM HILL, ENG. MR. A. E. PURDIE, ARCHITECT, WILLESDEN, ENG.

INTERIOR VIEW OF THE SAME.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

PROTESTANT CHURCHES IN GERMANY.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs, — In speaking of the convention to be held in Berlin upon Protestant Lutheran churches, you speak of the absence in Germany of High and Low Church divisions. But there is an enormous difference between the Reformed State Church of Prussia, and the Old Lutheran Church of Saxony and Nuremberg. The churches of the former resemble French Protestant buildings and the gowns of the clergy are similar to the Calvinist Geneva black gown. But at Leipsic and Nuremberg (especially at the latter) the churches are as the Reformation found them, and the ministers wear the voluminous black gown and white ruff of Dr. Martin Luther himself. They are most picturesque objects, these Lutheran ministers; veritable living "Holbeins." At St. Lorenz, Nuremberg, the altars retain their crucifixes, candles and images; and around the church is a mass of statues, tryptichs and carvings. At Leipsic, where the churches only date back to the seventeenth and eighteenth centuries, candles and crucifixes are upon all the altars.

I send you these notes, as they may be interesting to your Boston readers who object to the reredos offered to Trinity Church!

Yours faithfully, S. BEALE.

THE LETTER-HEAD COMPETITION.

BOSTON, MASS., March 7, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs, — The McFarland Manufacturing Company's competition for an artistic Letter-head has taken place and the jury have unanimously agreed to place the design by "Your obedient servant" (A. B. Le Boutillier, 410 La Salle Avenue, Chicago, Ill.), first; that by "Laurel B" (Edwin R. Clark, Lowell, Mass.), second; and "Chance" (J. J. Driscoll, 426 Cross Street, Faulkner, Mass.), third.

Will you kindly insert this decision in the next issue of your paper, and oblige, Yours respectfully,

MCFARLAND MANUFACTURING CO.

THE STYLE OF THE PLYMOUTH, MASS., CHURCH.

BOSTON, MASS., March 14, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs, — As there has been considerable criticism of the architectural style of our design for the First Church, Plymouth, printed in the *American Architect* of last week, will you kindly allow us to say that we had no option in the matter. We were informed that no design would be considered unless it were Gothic in style. We urged the claims of Colonial, but without success. The design published was ultimately rejected, though for another plan also Gothic.

Very truly, CRAM, WENTWORTH & GOODHUE.

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NOTES AND CLIPPINGS

Electric-light Lamp-posts in London City. — The lamp-posts erected in the city [London] are of noble dimensions, the lantern being big enough for a man to get inside. To give access for trimming and cleaning, the posts have holes alternately on either side, into which the trimmer puts eight portable steps of light steel, by means of which he mounts, and which he removes as he comes down. As the result of some experiments, rippled-glass has been used in the lamp-tops, which, whilst cheaper than the ground and opal glass, also tested, absorbs less light — viz, 21.73 per cent, as against 25.18 per cent for the opal, and 46 24 per cent for the ground-glass. The glass used is one-seventh of an inch thick, and thus is not very liable to accidental injury. The bases of the posts are of an ornamental character. Considerable difficulty was experienced in getting satisfactory foundations for these lamps, owing to the crowded state of the subsoil, and many different patterns of base-plate had to be employed, thus increasing the difficulty of completing the work by the contract time. In addition to the arc-lamps, the city anthorities are also experimenting with large glow-lamps, though General Webber apparently thinks that these latter lamps are not being run under the best conditions. He considers that the glowing filament should not be exposed directly to the eye, but that it should be shaded by a glass cut into diamond-shaped facets, which, whilst breaking up the light satisfactorily, does not absorb anything like the amount which ground or opal glass would. Such lamps, weighing much less than arc-lamps, might easily be hung from light brackets fixed to the walls of the houses adjoining the street. Glow-lamps of course require much less attention from lamp-trimmers than arc-lamps, and hence a larger number of watts per candle-power can be economically used in them. — *Engineering.*

Wooden Water-mains. — A recent paper read before the American Society of Civil Engineers by James D. Schuyler, Member of the American Society of Civil Engineers, on "The Water-works of Denver, Col.," contained some very interesting observations and figures relating to this subject. He states that sixteen miles of thirty-inch wooden conduit were constructed in that work in addition to a considerable length of forty-four inch pipe. The timber used was California redwood, and the thirty-inch conduit was constructed to stand under a head of 185 feet. We understand from the paper named that the total average cost of the thirty-inch pipe was $1.36 per lineal foot, of which about forty-eight cents constituted the cost of trenching and back-filling. A gang of eight to sixteen men laid from 150 to 300 feet of the same size conduit per day. These mains were composed of staves dressed very smooth to cylindrical sides and radial edges, and were held to the cylindrical form by mild-steel bands placed at a distance apart depending upon the head, but never exceeding seventeen inches. The pores of the wood are filled with the water under pressure, so that it oozes through to a slight extent, thus realizing the condition for permanent preservation. The pipe is framed in the trench, and all handling in full-size sections is avoided; at the same time the interior finish is so smooth that the most advantageous conditions of flow are secured. Mr. Schuyler estimates that the use of these wooden conduits effected a saving of over $1,000,000 in this particular work. — *Fire and Water.*

Rank as an Artist's Reward. — In conferring a baronetcy upon the great painter, Burne-Jones, Queen Victoria has merely followed the example of most of her fellow-sovereigns of Europe in granting titular and hereditary dignities to the men famous in the literary, scientific and artistic world. Thus, in Austria, the painter Munkaczy has been created a baron by the Emperor, whilst the late painter Makart was ennobled. The late Marquis de Molins, who for so many years represented Spain at the French capital, owed his title to his literary achievements. In Italy there are no less than four members of the Senate who owe their appointment to the King, who has endeavored thereby to recognize their achievements in literature and art. Among them are Verdi, the composer, the poet Carducci, the painter Morelli and the author Mantegazza. France has always been the most generous of all countries in honoring talent of this kind, and the Senate during the First and Second Empire, and the Chamber of Peers under King Louis XVIII, King Charles X and King Louis Phillippe, comprised a large number of poets, scientists, artists and authors of eminence. — *Marquise de Fontenoy in the Philadelphia Press.*

A Railroad Through the Sea. — An interesting experiment is about to be carried out at Brighton in the shape of the construction of a marine railway for the purpose of connecting Brighton with the little village of Rottingdean, some three or four miles to the eastward. The rails will be laid on the solid rock with concrete, and at high water will be covered by the sea, which, however, will not affect the carriages, the latter being supported on a framework that keeps them high and dry. At this part of the coast the cliffs are high, and the beach is practically inaccessible, so that no boating-traffic will be interfered with. The cars will be moved by electricity, like those now in use along the eastern foreshore of Brighton. — *London Daily News.*

Building a House of Buttons. — Clapisson, the French musical celebrity, is building a château composed entirely of buttons. The walls, the ceilings, the doors, the exterior, the interior are all ornamented with this novel element of architecture. Buttons of every description, from the very origin of their invention up to those of the present day, have been employed in the arabesques and ornamentation of the walls. Every country has been ransacked, and some curious specimens have been brought to light. Those dating from the lower Greek empire are of the most curious manufacture. — *London Tid-Bits.*

The "Barren Lands" of Canada. — Mr. Joseph B. Tyrrell, a geologist, and his brother, James W. Tyrrell, a surveyor, returned recently from an exploring expedition in what are known as the "Barren Lands" of Canada, the district between the Athabasca and Mackenzie River basins and the west shore of Hudson's Bay, most of which, probably, had not been trodden before by human foot. Mr. Tyrrell says of the country through which he passed that it might be likened, in a measure, to a prairie. "It is a rugged, rolling tract of land speckled over with swamps and occasionally rocky hills. In the whole Barren Lands there is not wood enough to make a boot-peg of." — *N. Y. Evening Post.*

A Tip for Travellers. — An American actress recently called in at a hardware store and purchased "a pair of nippers and half-a-dozen eighteen-inch gas-burner tips." All theatrical people while travelling in the United States are said to consider nippers and tips an indispensable part of their luggage. It seems that the managers of hotels in small towns try to save gas by putting bits of cotton in the bedroom-burners, thus impeding the flow. The minute an actor strikes a light and detects this he pulls out his nippers and tips, off comes the "faked" burner and on goes one that secures a full supply. The motto of the great American nation is: "If they don't give you what you pay for, take it," and a very good one, too. — *Invention.*

The Internal Heat of Trees. — The internal temperature of trees has been investigated in Belgium by M. W. Prinz, who finds that, as a rule, a large tree is warmer than the air in winter, and a little colder than the air in summer. The mean annual temperature of a tree is practically the same as that of the surrounding air, but the monthly means differ by several degrees. Heat changes are transmitted slowly to the heart of a tree, the temperature of the interior differing sometimes as much as 10° C. from that of the air. When the air temperature is below freezing-point, the temperature of the tree appears to remain just above the freezing-point of its sap, and in the hot days of summer the internal temperature was not known to vary more than 2° from 15° C. (59° F.). — *Invention.*

Buffalo without Water for Two Hours. — For nearly two hours recently Buffalo was completely without water and at the mercy of fire, and had one broken out the result would have undoubtedly been disastrous. The cause was the failure of the natural-gas supply which is used to run the engines at the pumping-station. About 8.30 o'clock the gas suddenly gave out, without any warning, and the gas-sheets had to be ripped out, and the furnaces put in condition to burn coal. This task occupied over an hour and a half, during which time the engines were idle, and no water went through the mains. The same thing happened about three weeks ago, and as a consequence the Water Department will at once begin the entire substitution of coal for gas, as the latter has become too uncertain to risk its continuance as fuel. — *N. Y. Tribune.*

Statuary Marble in Colombia. — A crystalline metamorphic limestone deposit, equal in beauty and quality to the finest statuary marble of Massa-Carrara, Italy, is reported upon by Mr. C. F. Z. Caracristi, C. E., as existing in unlimited quantity in the Department of Magdalena, Republic of Colombia. The stone is a great mass covering 60 square miles and lies one mile from the Carribbean Sea, a few miles from the Bay of Caira and one day's sail from the Panama Railway. It is white, gray and black in color, or varied with white, gray, black and pink, and withstands a crushing strain of 11,300 pounds per square inch. The engineer mentioned says that it can be transferred to New York for $3.65 per ton, and he estimates the cost of producing dimension stone at the quarry at thirty cents, gold, per cubic foot. The Santa Marta Railway passes within one-half mile of the quarries. — *Engineering News.*

For Completing the Panama Canal. — Edmond Bartissol, a civil engineer, who helped pierce the Isthmus of Suez, has made public his plan for completing the Panama Canal. He proposes to build a stone tunnel about ten kilometres, or six miles, long. Water from the Chagres River would be conducted by shafts to this tunnel and there be used to carry to the Pacific the soil already excavated from the canal-bed and thrown in the way of the current. The canal could be completed by such means in four years, M. Bartissol estimates, at a maximum expense of 500,000,000 francs. This plan was submitted some time ago to the Technical Commission of the Panama Canal Company. The commissioners have reported to M. Monchicourt, the judicial liquidator, that they were not sanguine of the success of the plan, but thought it expedient to try the proposed experiment under certain conditions. They are against the proposal to appeal for funds with which to build M. Bartissol's tunnel. — *N. Y. Tribune.*

The Electrical Treatment of Sewage. — It is likely that the question of the electrical treatment of sewage will be occupying a good deal of public attention before long. The success of the experiments made at Havre, under the supervision of the inventor, M. Hermite, has created lively interest in Paris, where the expenditure of 117,000,000 francs for new sewers is now under consideration. M. Magnard of the *Figaro* has set up an electrolizer in his offices, with which a series of experiments will be made in the presence of ministers, senators, deputies and other public personages. M. Humbert, president of the Paris Municipal Council, already has devoted much time to a consideration of the process, which, if it can do all that is claimed for it, threatens to revolutionize all existing ideas on the subject of drainage and to render sewers practically superfluous. If the foulest of liquids can be rendered odorless and innocuous by a swift and inexpensive method, one of the most troublesome of municipal and sanitary problems will have been solved. — *N. Y. Evening Post.*

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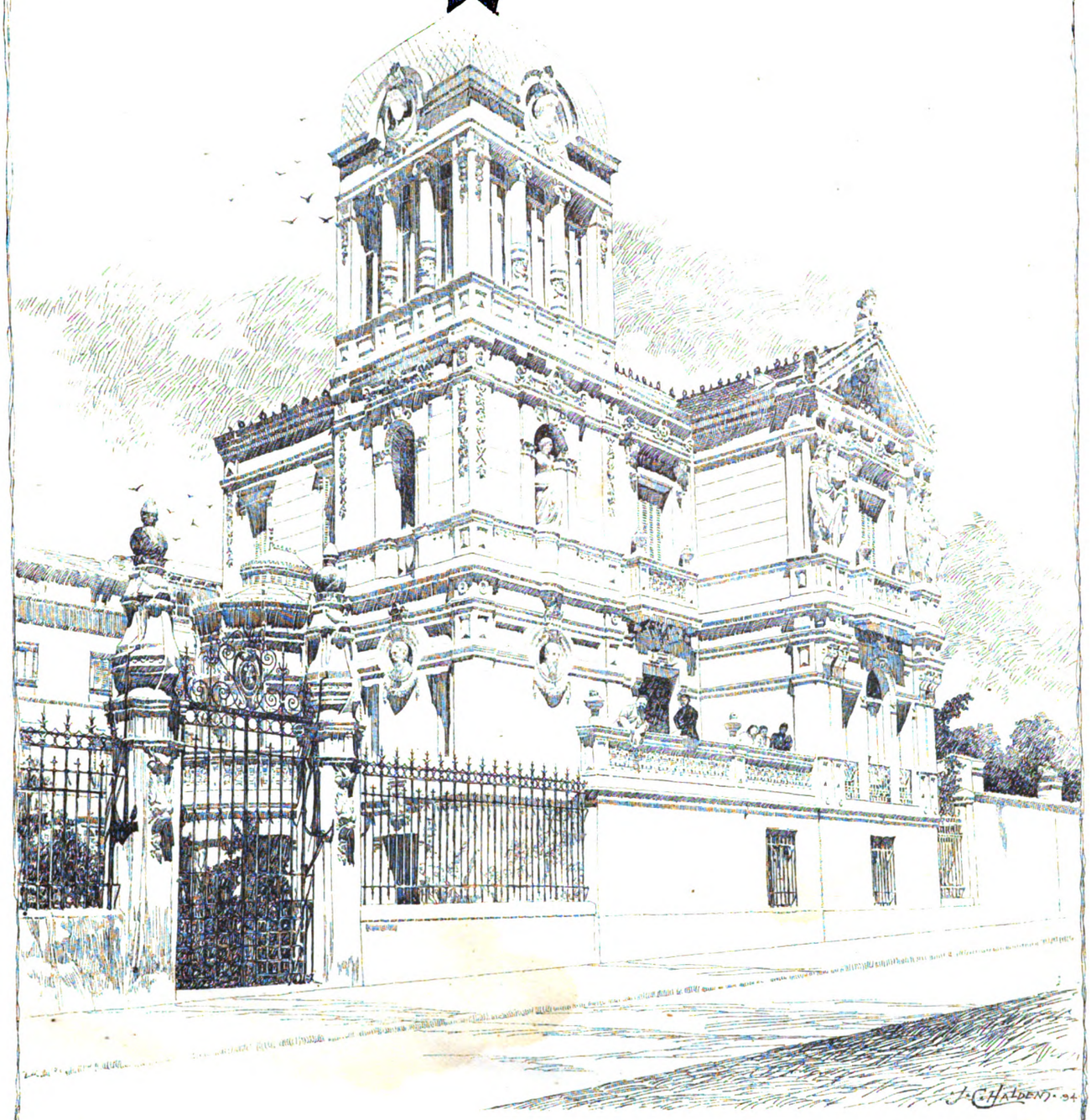
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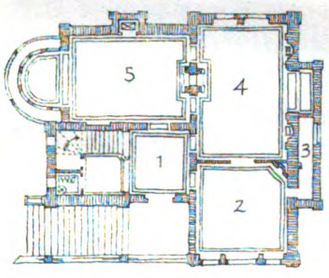
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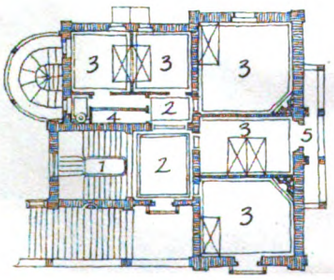
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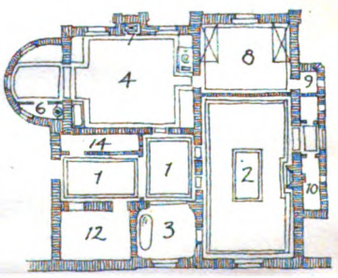




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SECOND FLOOR.



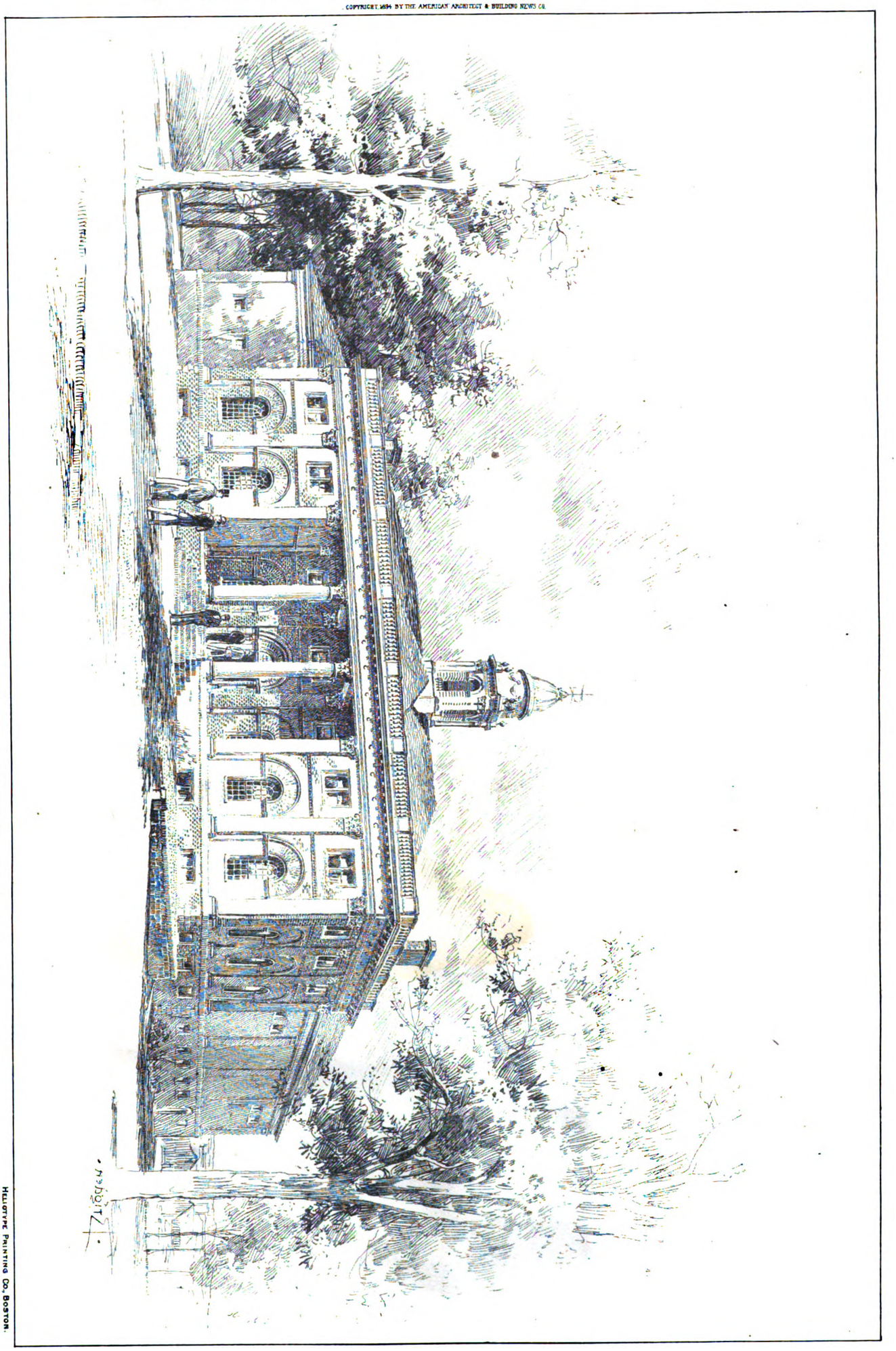
BASEMENT PLAN.

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GYMNASIUM AND ARMORY BUILDING AT RUTGERS COLLEGE, NEW BRUNSWICK, N. J.

CHARLES ALLING GIFFORD, Architect, 31 Union Square West, New York.

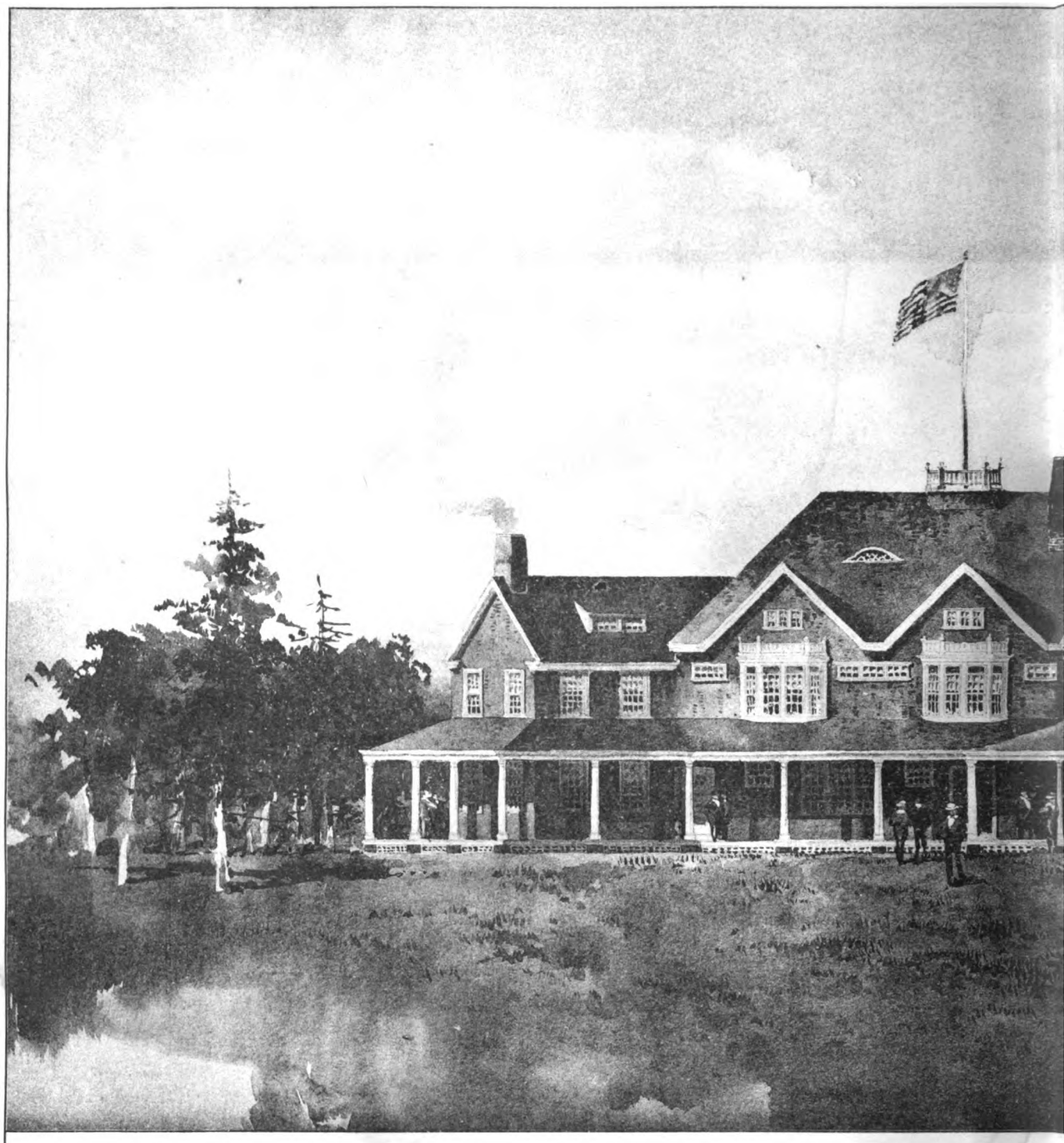
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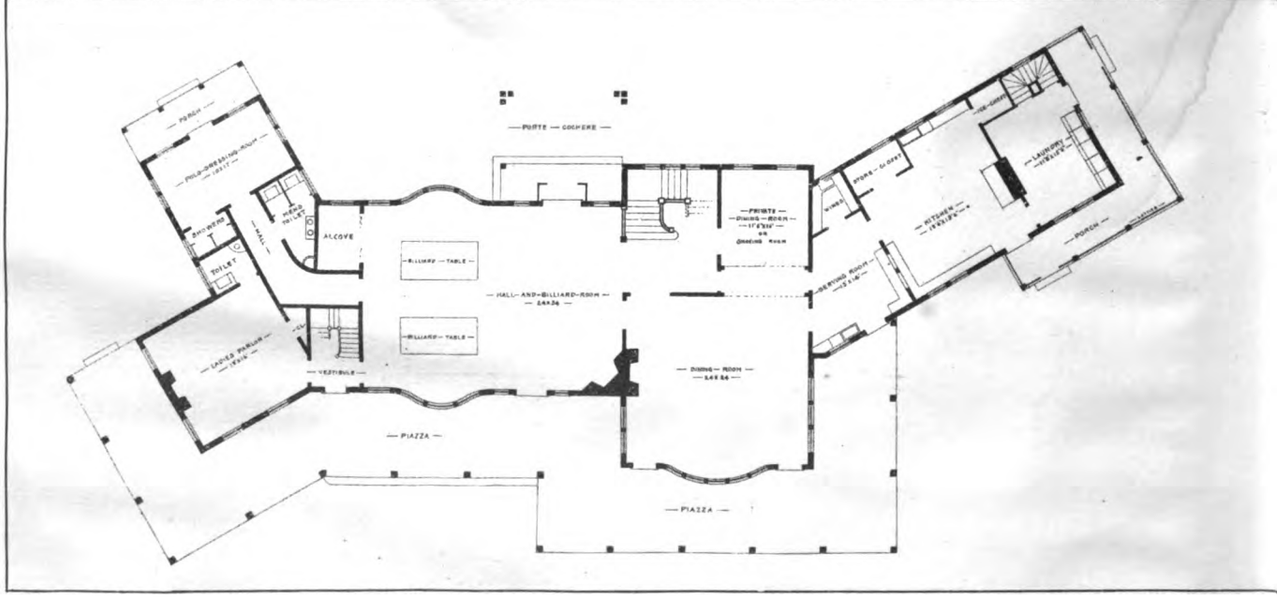
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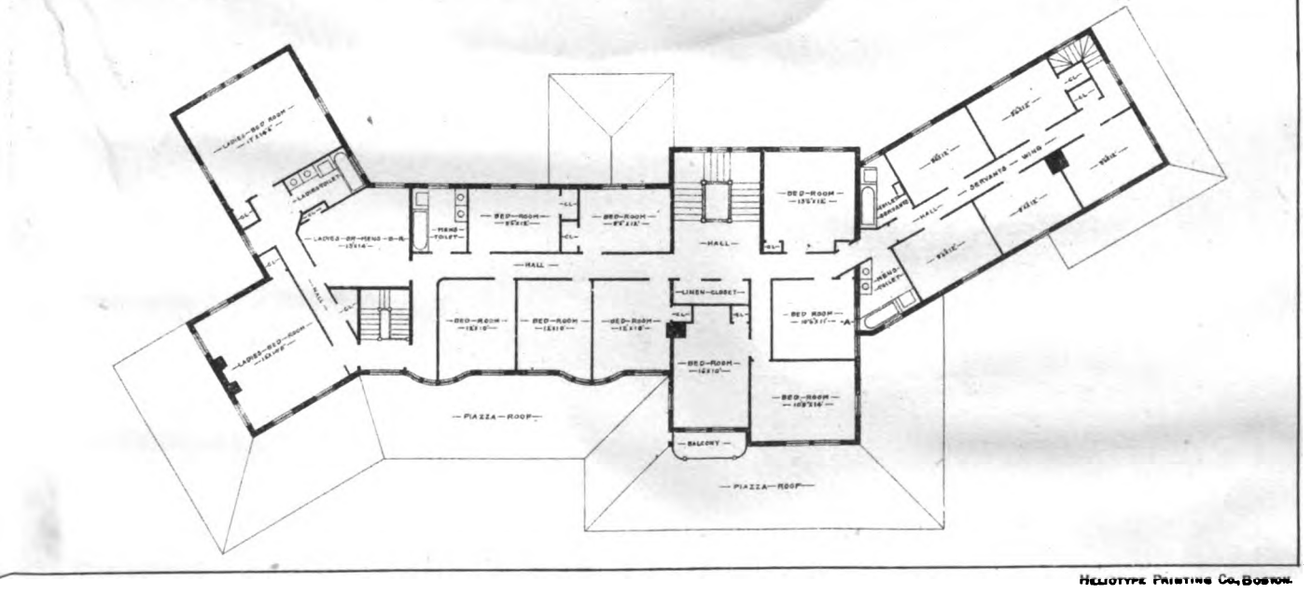
COUNTRY CLUB-HOUSE ON

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MARCH 24, 1894.

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THE efforts which the Committee of the Institute has been making, apparently with growing success, to secure the attention of the Treasury officials to the public sentiment in favor of the designing of Government buildings by private architects, have met with an unexpected check. It will be remembered that, early in January, the Directors of the Institute were requested by the Baltimore Chapter to consider a newspaper cut, purporting to represent the intended design for the Buffalo Federal Building. The Directors, as requested, examined the design, and, in consequence, drew up a letter to the Secretary of the Treasury, saying that they believed it their duty to the profession and the community to protest against its execution, and that, in their opinion, any structure of the general character of the design represented by the cut would, if carried into execution, "be found absolutely wanting in the fundamental elements which go to make a public building," and would "be condemned by the community." Of course, the Institute Directors realized fully the peril of interfering with a professional brother, even though the official station of the latter made his work a proper subject of public criticism, but it is hard to see how, with a due sense of their responsibility to the public and the profession, they could have avoided taking some such action in regard to the matter thus formally brought before them.

NOTWITHSTANDING this obligation on their part, as the official guardians of the interests of American architecture, to take action which they would never have dreamed of as private individuals, Mr. O'Rourke chose to make a personal matter of the letter, which the Secretary of the Treasury, to whom it was addressed, rather inconsiderately turned over to him, and wrote to the Secretary of the Institute, accusing the Directors of lack of professional courtesy and good breeding, and of basing their communication on *ex parte* and indefinite information. We think that there was some reason for the latter reproach, but the Directors could hardly have been expected to go to Washington to see whether the proposed design corresponded with the newspaper cut, and they were careful to make their criticism conditional on the resemblance of the actual design to the cut. A long correspondence followed, in which Mr. O'Rourke, while assuming to maintain a disposition to assist in any proper effort for having the designing of public buildings put on such a basis as is intended by the Tarsney bill, could scarcely have been expected to avoid some slight feeling of resentment against the Institute Directors personally. Very recently, the whole matter seems to have been brought to a climax by a letter from President Burnham to the Secretary of the Treasury, who replied to it in a heated vein, characterizing it as "offensive and ungentlemanly," and declining to hold any further correspondence with him "on any subject." For the present, therefore, the negotiations appear to be closed, so far as the Institute is concerned, and it is to the newspapers, who have exerted great influence in favor of the Tarsney bill, and to members of Congress, that the people must now look to promote the movement in favor of better design for public buildings. Meanwhile, there are indications that the employés in the Government architect's office, who are naturally opposed to the bill, and have the advantage of being on the ground, will endeavor this season to have it amended, so as to render it as far as possible inoperative, or perhaps, by seizing a favorable opportunity, repealed altogether, and the Institute Committee will do well to be on the look-out for such attempts.

THE whole story serves, as we think, to emphasize the importance of having the Institute represented at Washington. If it is impracticable, as it probably would be now, to have the Secretary's office there, the Director's meetings could be held there with very little inconvenience, and the advantage would be incalculable. At present, the crying artistic scandal of this country is the system of designing public buildings. We are so accustomed to the crude, unstudied structures which the Government erects in all our large cities that we do not think what an artistic education would have been afforded the public, with the same expenditure, by well-designed work, and we forget that the time for making a change is rapidly passing by. Already, every first-class city is supplied with Government buildings which will be a reproach to us for many generations, and the cities of the second class, which still afford some field for better things, are fast being supplied with objects of the same sort. If anything is to be done for public art, it must be done quickly, and the remedies, to act promptly, should be applied as nearly as possible at the seat of the disease, namely, at Washington.

A CURIOUS question has come up in New York. Mr. Elbridge T. Gerry, who is well known as a yachtsman, is having a building on Maiden Lane, belonging to his wife, painted a bright orange color. It happens that Maiden Lane is mostly occupied by jewellers, and some of these, who have windows opposite Mrs. Gerry's building, find that, when the sun falls on its orange-colored paint, the reflected rays affect the color of the white diamonds displayed in their windows, making them look yellow, and, apparently, destroying a great part of their value, as a yellowish diamond is worth only a small fraction of the value of a pure white stone. The jewellers whose property is thus affected met the other day, and civilly requested Mr. Gerry to allow his building to be painted of a different color, offering to pay the whole expense themselves. This request Mr. Gerry is reported to have refused, saying that he once painted another building of his, on Broadway, of a bright red color, and that the neighbors objected, but afterwards became reconciled to it. Mr. Gerry has the reputation of being a fair-minded and amiable man, and it ought not to be necessary to point out to him that a diamond merchant, to whom it is essential to be able to judge the color of stones correctly, could hardly carry on business in a glare of orange-colored light, however it might be with clothiers on Broadway. If the buildings opposite the flame-colored front were tenanted by artists, Mr. Gerry might count with confidence on seeing them pack up their goods and move away before his decoration was even finished, and there must be some limit to the right of a man to destroy his neighbors' business by his whims. He would probably not be pleased if the jewellers, unable to carry on their own business, should sublet their buildings to coppersmiths and soap-makers, yet their right to do so would be much less questionable than his right to indulge an extraordinary freak at their expense.

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WITH the approach of the warm season, the subject of the disposal of city garbage is likely to attract renewed attention. In England, as is well known, a dozen or more of the large cities dispose of house-refuse by incineration, or, as it is popularly called, by cremation. In most of these places, the waste heat from the cremating furnaces, which are kept at a high temperature, is utilized for heating steam-boilers, and the power thus developed is used in some places for pumping water or sewage, and in others for driving dynamos for furnishing electric-light. In this way, some return is obtained, which lessens the cost of the garbage disposal, but, so far as we know, no valuable element is saved from the garbage itself, except the ashes, which contain potash and phosphates, and can be sold to the fertilizer manufacturers. In this country, we think that no attempt has yet been made, at least on a large scale, to utilize the waste heat from the cremation furnaces, of which many are in use, for producing steam-power, but other plans for saving expense are occasionally adopted, which are unknown abroad. In one system, which is in successful operation in several places, the garbage, on being delivered, is put first into immense iron cylinders, and naphtha then pumped in, many barrels being required for a charge. The naphtha dissolves the grease and fat, which forms from five to ten per cent of house garbage, and, after being allowed to act for a certain time, is pumped out of the cylinders into stills, and re-distilled, for renewed use, the greasy residuum left from the distillation being collected and sold to soap-makers. The garbage from which the fat has been thus extracted is emptied from the cylinders into the furnaces, and burnt to ashes. Although this process seems a complicated one, it is said that the value of the grease saved is nearly or quite sufficient to pay the cost of fuel for the subsequent incineration of the residuum. In most American cremation plants, however, the whole garbage is simply burned to ashes, the difference between the various systems consisting mainly in the efficiency of the furnaces employed; and, by any of these systems, as yet in regular operation, the cost of fuel is very considerable, varying from fifty cents to two dollars for each ton of garbage destroyed, the greatest economy, naturally, being secured in the more extensive establishments.

THEORETICALLY, fresh garbage contains several valuable elements, which might be separated with advantage, if a practicable system were available for accomplishing this result. Besides the grease, which can be separated by digestion with naphtha, garbage usually contains a considerable proportion of alcohol, which could be saved by careful distillation; and also acetic and lactic acids, which might perhaps be profitably collected; while, if the burning of the garbage could be controlled, so as to stop just short of burning the carbonaceous matters, a mixture of animal and vegetable charcoal would be obtained, which would be more valuable as a fertilizer than the ashes left after complete incineration. In Philadelphia, where much attention has been given to the subject, it is said that furnaces are to be constructed this year, where utilization of the valuable products will be attempted more thoroughly than ever before, and the result of the experiment will be watched with interest. So far as sanitary efficiency is concerned, the object to be sought is not so much the utilization of the ingredients of the garbage as its speedy sterilization. In some of the processes, the first step is to pick the decaying mass over by hand, either to remove the tin cans and old bottles, which would derange the apparatus in which it is to be treated subsequently, or to pick out the bones, which are more valuable in their natural condition than after treatment. All such hand-picking is objectionable. To say nothing of the effect on health of the emanations from the decaying mass, it is more than likely that, in times of epidemic, the garbage would swarm with disease-germs, which might easily enter the systems of the women and children who do such work, or be carried by them to others; and the object should be to avoid every kind of storage or re-handling after the garbage has once been put into the carts. In Chicago, this principle has been carried to a curious extreme, the sanitary police there sending portable cremating furnaces, mounted on wheels like a fire-engine, through the streets. These machines stop in front of each house, and the family swill-pail is brought out, emptied into the furnace, and its contents cremated on the spot. Although this system has undoubted sanitary advantages, it can hardly be an economical one, and the future will perhaps bring forth a system by which equally satisfactory results, so far as health is concerned, can be obtained at less cost.

MR. BRAGDON, whose interesting drawings and the accompanying paper are published in this issue, suggests that the resulting value of his efforts will be all the greater, if those who are familiar with the Genesee Valley will bring to his attention, through us, any buildings which have in or about them features of interest correlative with those which are exhibited this week. We sincerely trust that this will be done and will point out that, as it is often difficult to obtain access to private buildings, letters of introduction would be found of much service. We will add, that similar help will be appreciated by Mr. Gardner, who is following a similar line of research in a portion of the Connecticut Valley.

THE foreign papers give some interesting facts about M. Alfred Solvay, the great Belgian soda manufacturer, who has just died at Nice. M. Solvay, son of a salt-manufacturer, and born at Rebecq fifty-four years ago, was intended for a commercial life, and had passed some years in counting-rooms when his brother Ernest, who had invented a new process for extracting soda from salt, and had set up a little experimental factory, sent for him to come and help him. The two brothers worked together for many years, poor and almost discouraged, before they were able to make their process practically successful; but they persisted and, at last, they were able to compete on even terms with other manufacturers. From that time their business rapidly increased, until now the firm of Solvay Brothers owns one of the largest establishments in Europe, producing five hundred thousand tons of soda a year, or about one-half of the total consumption of the world.

A STORY is told by a London paper about the widow of Alphonse de Neuville, perhaps the greatest of the great French military painters. The Parisian picture-dealers are by no means unacquainted with the art of signing a picture with a name to which it is not entitled, for the sake of selling it at a high price; and Madame de Neuville keeps a sharp look-out for deceptions of this sort. The other day, as she was walking by a picture-store, she saw a picture in the window signed "Alphonse de Neuville," representing an "Attack on a Village." She did not recognize the picture, but doubted whether it was really her husband's work, and went in to make inquiries. The dealer assured her that it was genuine, but she departed unconvinced. Not wishing either to begin legal proceedings against the dealer, or to leave him to sell a picture under a forged signature, she devised a scheme for getting it into her own hands. She sent a messenger to say that a lady wished the picture sent to her, and would pay for it on delivery, giving her own address, but a false name. The picture was sent, but no sooner had she obtained possession of it than she refused to pay for it, and said that she should not only keep it, but sue the dealer for damages. The dealer, who highly disapproved this proceeding, brought an action for the recovery of his property, and the Court ordered it to be restored to him, but directed further that a commission of experts should examine the picture, and pronounce upon its genuineness, and that it should not be exposed for sale until their decision was given.

IT must be at least twenty years since the New York officials began to talk of improving the water-front of the city, and it is with a little incredulity that we read that the plans are ready for a system of docks on the North River, extending from Charles Street to Twenty-third Street, and to cost nine million dollars. There is no doubt that New York needs such an improvement urgently, but it does not necessarily follow that the improvement will be made, and our conviction that it is likely to be accomplished will wait until we see the work going on. Meanwhile, the worst thing about the new plans of the Dock Board, as described in the newspapers, seems to be that they contemplate a "splendid driveway" along the water-front. We all know what a "splendid driveway" in the less fashionable parts of lower New York means; and those who, after wading across West Street on a showery day, thank their stars, as they examine their mud-splashed clothes, that it is no wider, will view with alarm the prospect of having the piers cut off from the city by a still broader expanse of filth.

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THE FRENCH RENAISSANCE.[1] — V.

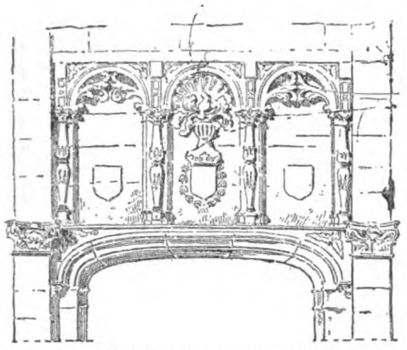


Fig. 15. Mantelpiece at Nantouillet.

NONE of these architects — to whom we must add, if not for their originality, at least for their knowledge and skill, Nicolas and Colin Biard, Pierre Fain, Roland Leroux, Pierre Lescot, the Ducerceaus, Sambin, Ribonnier and Bachelier — attempted to turn his talent in a direction contrary to that dictated by the material and moral condition of Europe in the sixteenth century. Far from battling against the stream, which was moreover irresistible, the boldest among them strove to increase its velocity. It is particularly to Jean Bullant, Philibert Delorme and Jacques Androuet Ducerceau that we are indebted for the characteristics which most clearly distinguish the style of Henri II from that of François I and which foretell most certainly the triumph of ancient art.

It is to the style of François I, the Renaissance *par excellence*, that the foregoing observations on the originality and spiritedness of our French art are literally applicable. This preëminently brilliant period had also one characteristic not possessed to a like degree by any preceding period, for its sole reliance was on the direct and intelligent patronage of a monarch. It might seem irreverent in us to pass over Rabelais in silence. This immortal genius was indeed the living reflection of his age, and his writings account for and depict most accurately his intellectual and moral aspirations; but we will content ourselves with recalling here this indisputable fact, and will not subject the reader to a rehearsal of the fine-spun, subtile views which, in imitation of so many others, we might indulge in, concerning the artistic importance of the *Pantagruel* and of the episode relating to the abbey of Thélème. We will simply note this name Thélème, signifying caprice or whim, and the wonderful unevenness of the author's style in which his loftiest thoughts are expressed, sometimes nobly, sometimes in the most unrestrained language. The same peculiarity existed in François I to an eminent degree, and with him to this was added executive power. He was the embodiment and the promoter of all the qualities, good or bad, of his age, and this accord between sovereign, circumstances and artists contributed not a little toward the stamping of architecture for more than thirty years with that clearly-defined character and that appearance of freedom under genuinely logical restrictions, which make the study of structures erected between 1515 or 1520 and 1550 so attractive and profitable.



Fig. 16. Composite Capital.

Other French kings had loved art but for the luxuries that it procured them; they exercised no personal control over its forms. François I built palaces and acquired statues, chased-work and paintings as an amateur; he was enchanted with the Renaissance and was possessed of the very laudable desire to multiply and perfect its manifestations; in this respect, let us not seek to conceal the fact, he was an Italian lord, such as Florence produced in the time of the early Medicis, or Rome in the time of Julius II.

We know what a wonderful impetus is given to an art, and especially to architecture, by activity of production or, as it would be expressed to-day, by a great number of important orders. Now, François I was able to keep about ten good architects employed constantly; he undertook the erection of five royal residences of the highest rank, namely, the Louvre, the palace of Fontainebleau and the Château of Saint-Germain, Villers-Cotterets and Chambord; the works on the last four were far advanced at the time of the king's death. At Blois his name is attached to the main wing, which is a masterpiece. The smaller castles of Madrid, near Paris, Challuau, Folembray and La Muette (in the forest of Saint-Germain) were built in accordance with his orders.

It was impossible to keep pace with such a prince, as many great lords had done with Louis XII; but no one could feel humiliated in assuming the rôle of a distant imitator of François I, and his courtiers did not hesitate to accept it. Still, in view of the achievements of Georges d'Amboise, we cannot but be surprised to see another not less powerful minister clinging, as it were, to the artistic tastes of an honest bourgeois in the midst of this marvellous display of magnificence. Either Cardinal Duprat was miserly, or he was afraid to break into the millions which he held in reserve, we are assured, to purchase his election to the papal throne; or he may have had his own ideas of his duties as a courtier; he feared, perhaps, to wound his benefactor, or lose his favor, by an ostentation out of keeping with the obscurity of his origin. It is, nevertheless, true that the Château of Nantouillet, notwithstanding its few happy details (Fig. 15), is unworthy of an archbishop of Sens and a chancellor of France.



Fig. 17. Composite Capital.

As the period of François I was, as has already been clearly shown, the period when a wisely directed logic gave free entrance to a thousand fancies, the period of art for the sake of art, the period when architecture to enhance its beauties brought into requisition all its own resources and all those of sculpture and painting, structure and monumental decoration broke up into unrecognizable varieties. A few characteristics alone, which may, however, be made to include most of the others, admit of systematic classification through their value and persistence.

The style of François I accommodates itself in a wonderful way to all that is graceful, to all that embellishes, varies or lightens a construction. The semicircular form reigns more than ever in vaults, arches, doors and windows; often a framed square bay is set in a second semicircular frame. The Corinthian order with channelled shafts is plainly preferred, but the capital is rather a composite or fancy capital (Figs. 16

[1] From the French of Anthyme Saint-Paul, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 950, page 113.

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and 17). Moreover, until the close of the period of Henri II, sculptors, particularly in the case of isolated columns, endeavored to design capitals not belonging to any Classic order, and several of these individual creations exhibit a great deal of spirit as well as harmony. The shaft of the column, if not

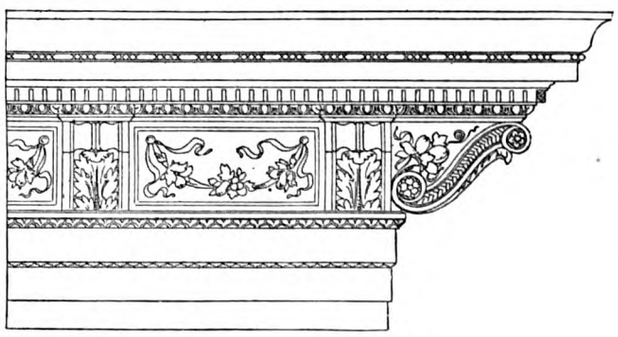


Fig. 18. Cornice at Fontainebleau.

channelled, and, sometimes even when it is, is delicately decorated; the pilaster offers a more favorable field for ornamentation which is often taken advantage of for trail, floral, arabesque and fleur-de-lis embellishments; these are allowed to run over here and there onto the face of the walls. The friezes furnish a theme with almost endless possibilities of variation. The cornices having, as we have noted, much less æsthetic importance here than in Italy, where they may make or spoil the general aspect of an edifice, are nevertheless correctly proportioned in thickness and projection; and even their decoration recalls the antique (Fig. 18), or the religious or military monuments of former centuries; on the banks of the Loire, for example, coronas *à coquilles* (refer to Fig. 3) affiliate with the machicolations common in Touraine and Anjou in the fifteenth century.

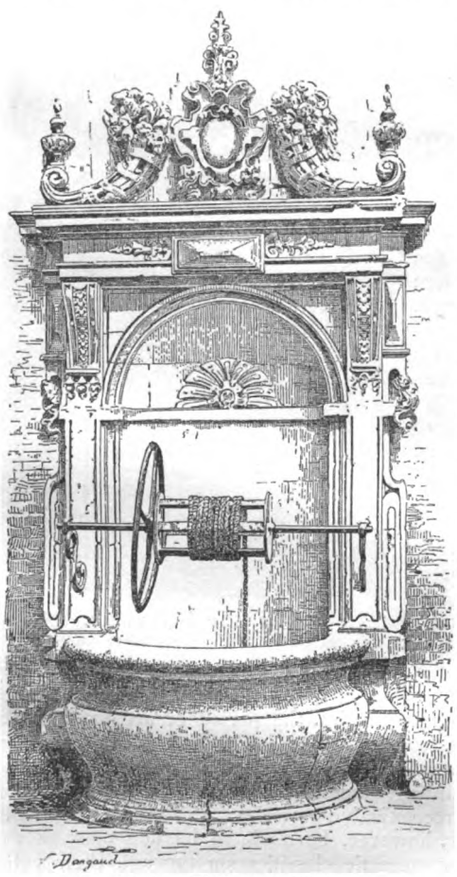


Fig. 19. Well at Toulouse.

The doors and windows were made the subject of most careful and mature study on the part of the architect. In adopting the pediment to crown them, when the bays were rectangular, the designer could modify it at will; he could accuse the angle to such a degree as to make it identical with the Gothic gable; if the pediment seemed to be inconsistent with the general effect, especially in dormer-windows, he could replace it with various other crownings (Fig. 19, a curious example taken from a well, the frame of which resembles that of a window; see also Figs. 20 and 20*a*), shell-shaped, with a semicircular tympanum, with curves and counter-curves. The festoons which the Renaissance adopted from Gothic art, and the applications of which it developed, were utilized, wherever it was expedient to introduce them, in correcting or filling-in a finial, angle or extrados (Fig. 21).

The French Renaissance, especially in Normandy, avoided the nude, not, let it be clearly understood, the nude of the Academies — we might cite many a frieze, coving or staircase ceiling faithfully depicting the coarsest scenes and language in the *Pantagruel* — but the bare wall, the plain surface. The Bretons, with their granite, struggled to adorn their porches, towers and church gables lavishly, leaving the smallest possible amount of smooth surface. Though this profuseness may seem to the severe critic much exaggerated, though it may bewilder the spectator, though it may lead to a confusion of the accessory and the principal, it would be unjust to assert that it makes the monument heavy; for though it defies all restrictions as to expansion, it is limited in projection; this is so slight that, apart from the statuary proper, the term "chasing" would be more applicable to it than "carving."

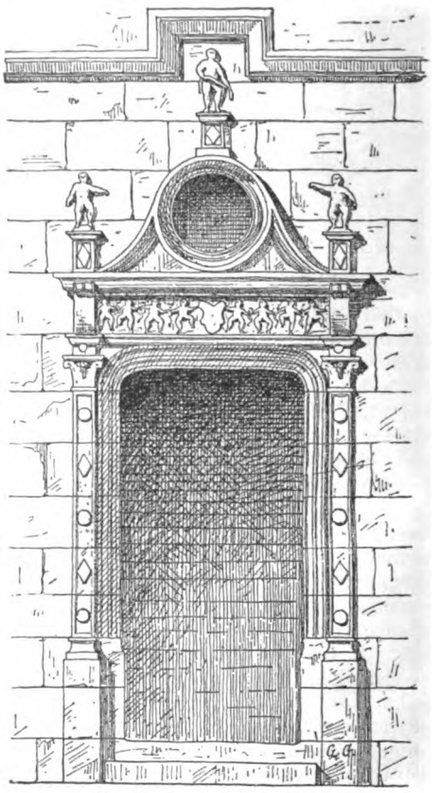


Fig. 20. Doorway at Etampes.

With the reign of Henri II came a perceptible change. This monarch possessed neither the elevated tastes nor the brilliant qualities of his father. His sons, maintained in jealous guardianship by Catherine de' Medici, had, in addition, their lives darkened by the intrigues of the Protestants against the Catholics and by the plottings directed by the queen-mother against the Protestants. There were fêtes, but these were only one of the means used to promote political machinations; joy and serenity were wholly wanting in them. Beneath this heavy storm-laden sky who would have thought of

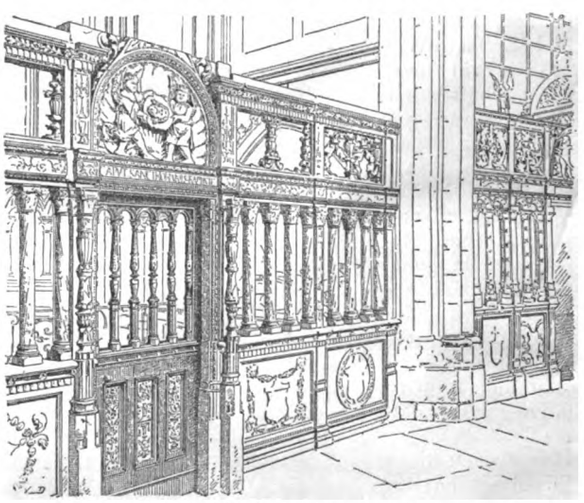


Fig. 20*a*. Choir Enclosure (Church of Fécamp).

bestrewing architectural productions with flowers? Certainly not the Protestants, nor those who, without sharing their theological beliefs, were attracted or favorably impressed by their Puritanism.

The progress of the Classic orders is a striking indication,

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and it was, perhaps, one of the most active causes, of the new tendencies. The colossal order made its appearance, and, though not yet predominant, sacrifices of growing importance were, nevertheless, made to the column. From this time forward we find columns doubled or coupled, "French columns" and colonnades rising one above another where formerly were mere pilasters, with all of the rest of the composition centering in them. The Doric with triglyphs and heads of victims plays the dominant rôle, which escaped from the Corinthian with as many variations as it was possible for it to undergo either alone or combined with the Ionic. In civil architecture, doors and windows are neglected or impoverished; especially is this true of the windows, for which the flat or semicircular arch is henceforth only an exception. Rustic and vermiculated work invade the walls. Sculpture becomes too ponderous to be lavishly used and loses, notably in bas-reliefs, the ground hitherto gained. Nevertheless, in regard to grace, wealth and spirit, the downfall was neither sudden nor complete. We are still in the Renaissance; unfortunately — fortunately rather to those who prefer Michael Angelo to Brunelleschi, Louis XIV to François I — the slope was too steep to be reascended; other countries that have blindly bowed down to Classic art, England and Italy for example, have met the same fate.

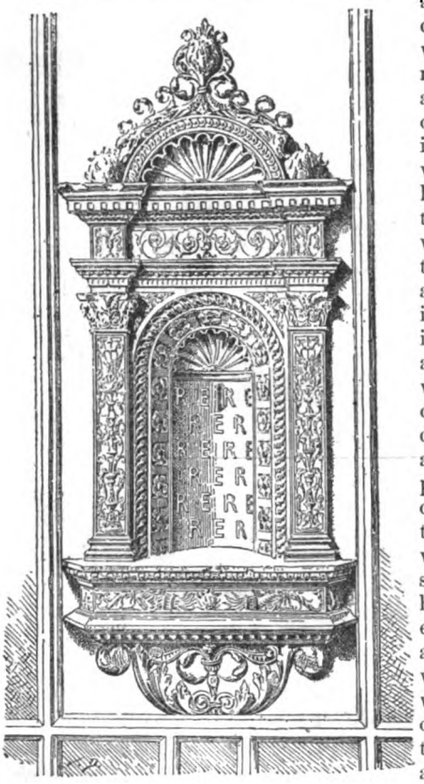


Fig. 21. Niche at the Hôtel Lallemant, Bourges.

(To be continued.)

PUBLIC SQUARES.[1] — V.

(*d*) THE POSITION OF MONUMENTAL BUILDINGS UPON OR AROUND THE OPEN SQUARE.

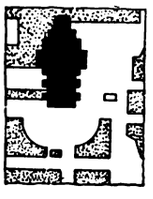


Fig. 77. San Nicolo, Catania, Italy.

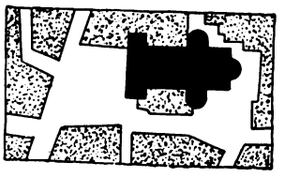


Fig. 78. Piazza del Duomo, Padua, Italy.

THE building free on only one side appears merely as a part of the frame of the square and lacks the completeness of a free-standing structure. For this reason in the fore-squares and still more in the "built *around* squares," the whole square should be considered as the main thing, and the surrounding buildings as subordinate parts of it. This subordination of each of the façades to the entire frame is found on the agora and forum of the ancients and in the best examples of modern and mediæval squares, and should be always striven for by the designer.

The structure free on two adjacent sides is not of frequent occurrence, such a position having in regularly-planned cities something of a forced look as the building juts into the square with a corner. In old cities, as in Catania (Fig. 77), this arrangement becomes picturesque, as the square is divided into two distinct parts, each of which corresponds to one side of the building. Similar arrangements occur in the Duomo Square of Sienna, Notre Dame, Rouen, and several church squares in Cologne and Wurtzburg. Imitation of such a picturesque arrangement is not impossible.

In Mediæval times, the churches were free on three sides, the fourth being connected with minor structures, such as the schools and convents (Figs. 74, 75, 78), but nowadays, as it is not necessary to have the minor buildings in direct communication with the church, it usually has a wholly free-standing position. To break with this custom in special cases is advisable, on account of the gain in effectiveness. Examples of the free-standing structures are shown in Figures 45, 46, 47, 48, 50.

A monumental building requires an independent position, not only on account of the greater effectiveness and convenience offered thereby, but also because its interior arrangement can be better expressed on the exterior.

For these reasons, court-houses, city-halls, parliament-houses, market-halls, exposition-buildings, baths, bourses, and especially libraries, archives, museums, concert-halls and theatres, on account of the security from fire, should be given free-standing positions on the open square. Although post-offices, barracks, high-schools and hospitals should not be connected with other buildings, they do not require an open square surrounding them, as they all have interior courts which are sufficient for recreation, household purposes and minor structures. They can be placed on a city block covering the whole, or only part of it, if they can be separated by a sufficiently wide space from the other buildings.

An independent structure does not necessarily require a central location on the square as shown in Figures 42, 45, 48 and 55.

The main façade, and even one or two of the other sides, may be emphasized by a larger fore-square, as in Figure 79, where there is a fore-square in front of the tower and another to the left and rear of the choir.

Several Squares around one Structure. — Buildings of great extent naturally subdivide the square upon which they are placed, into two, three or four minor divisions, as in Cologne where the cathedral divides the square, so that on the south there is the Domplatz; on the west the cloister square, and on the north the station square, all of which are of important extent. The Church of Santa Maria Maggiore, Rome, divides the piazza into the Piazza dell' Esquilino on the choir side, and the Piazza Santa Maria Maggiore on the façade side.



Fig. 79. Herwathplatz, Cologne, Prussia.

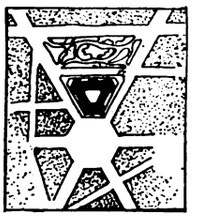


Fig. 80. Place des Pyrenees, Paris, France.

Even smaller structures are sometimes surrounded by several squares, as in Figure 38, where there are three independent squares around the theatre, and in Figure 80, which shows the Mairie of the Twentieth District, Paris, with the Square Tenon on one side and that of the Pyrénées on the other.

The Cathedrals of Amiens and of Orleans and Figures 41, 45 and 76 show similar arrangements. A remarkably beautiful example is the square grouping around the Cathedral of Salzburg (Fig. 81); on one side is the residence square, connected with the smaller Mozart Square, on the other side the Capitol Square, and in front is the Cathedral Square, separated from the other two by a colonnade. Such a manifold and picturesque arrangement of squares, decorated as they are with fountains and monuments, would constitute as complete a city picture as could be desired, if the Cathedral square were larger and if one of the buildings of the Capitol Square did not crowd the corner of the Cathedral.

The opposite procedure, the placing of several buildings on one square, although harder to manage as the difficulties of proportion are greatly increased, has been successfully accomplished in the Acropolis at Athens, the Duomo Square at Pisa, the Theatre Square at Dresden and the Gensdarmen Markt at Dresden (Fig. 53).

(*e*) *Square Grouping.* — Having discussed the division and grouping of one square surrounding a single structure, we will now consider those groups of squares which are shared by more than one building. We have already treated of a special case of this in the double, or twin, square which had its origin in the requirements of necessity, and will now consider those that are grouped around buildings on artistic principles.

The Campanile sharply separates the Piazza of St. Mark's from the Piazzetta, not on account of necessity, but for the sake of artistic arrangement. The Piazza is the fore-square to the church and is, at the same time, a monumental city square, and the Piazzetta is the fore-square to the Library and the Doge's Palace; the combination of the two into a group furnishes a most beautiful city composition.

[1] A graduating thesis by T. M. Newton of the Architectural Department of Columbia College, New York. Continued from No 949. page 104.

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A small, but also a remarkable, grouping is that at Modena (Fig. 35), where one of the squares is the fore-square to the church, the other to the Ducal Palace. A similar arrangement is found at Parma (Fig. 82), where also the palace and church have each a square. The square grouping at Brunswick is also very beautiful (Fig. 83). From these examples and the previously-mentioned grouping of the city-hall or market square with the cathedral square, so usual in mediæval cities, we recognize the importance of grouping squares artistically in beautifying a city. The arrangement depends on actual requirements, arbitrary innovations being naturally of small value.

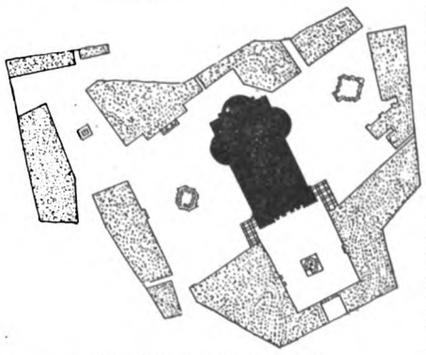


Fig. 81. Cathedral, Salzburg, Austria.

Square Grouping in a Broader Sense. — The artistic grouping of squares is to be striven after even in a broader sense. The requirements of Aristotle that public buildings should be placed all together in a city, holds good in small and newly-founded cities, but with the growth of the city, a distribution of the public buildings follows of itself. It is most important that this distribution should be controlled not only by useful but also by artistic considerations. The attention paid to these considerations gives the richness in motives and the pleasing variety that are seen in the older cities, as Rome, Florence, Nüremberg, Brunswick and in some of the new cities, particularly Paris and Brussels.

Confronting features as the Madeleine and the Palais Bourbon, the Tuileries and the Triumphal Arch, the Luxembourg Palace and the Observatory — such squares as the Place de la Concorde, Rond Point and Place de l'Étoille, Place d'Eylau, Place Jéna and the Trocadéro; and also terminal points such as the pedestrian on the Parisian boulevards enjoys when looking towards the Churches of La Trinité, Loretto, St. Vincent de Paul; and a similar artistic arrangement in the city enlargement of Cologne — give not only a beautiful picture on paper but are in reality in the highest degree effective and beautiful. The difference between the above and the rectangular or any other mere net-like system for laying-out streets, buildings and squares — forces itself convincingly upon the spectator and teaches him that the city can be made a work of art.

(*f*) *The Furnishing and Subdivision of the Square.* — The streets and public squares of a city can be likened respectively to the halls and rooms of a dwelling, not only as regards their arrangement and purpose, but also their furniture. Candelabra, bill-posters, newspaper-stands and the like are comparable with the household furniture; fountains, decorative masts, sculpture, columns and the like correspond to the objects of art in the room; plantations and flowers add beauty in one case as well as in the other.

The square when an empty space is like an empty room, and the erection of works of art should be practised more than hitherto. Greater attention should be given to the mere objects of use, such as lamp-posts, signs, sale-booths, enclosures and the like; for these architectural accessories have more to do with forming the public taste than the interior architecture of public buildings. We have a surfeit of statuary and other works of art in the museums and houses of the rich, but an emptiness, artistically, on the square.

The citizen visits the museum a few times a year or, generally, not at all, but he crosses the public square every day and necessarily sees it. The Greeks and Romans appreciated its importance as a means of instilling into the masses by its monumental architecture and beautiful statues, not only a feeling of patriotism but also a knowledge of art.

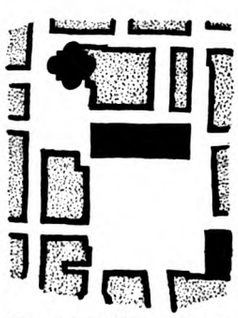


Fig. 82. Square Group, Parma, Italy.



Fig. 83. Square Group, Brunswick, Germany.

The picturesque, decorated wells of Mediæval cities, modified to suit the requirements of modern times, and many of the Italian statues could be readily used as decorations for our public squares The lines of sight and of traffic need not be disturbed by works of art or monumental buildings as only a work of importance can form the terminal point of a long vista or be placed in a central position on the square. It is seldom desirable to arrange monuments in a straight line, a grouping and a picturesque division being more pleasing.

The Subdivision of the Square. — The subdivision of the square by roads, sidewalks, refuges, plantations, booths, places for wells and monuments, seats, etc., is of great importance; and, as is the case with the carpets and hangings, seats and tables, conversation corners and artistic objects in our rooms, cannot be arbitrarily arranged without design and still less according to compass and rule.

The main streets may, if necessary, bend around an obstruction, but they must not be inconvenienced to any appreciable extent. The squares which are free from traffic must be arranged for accessibility and convenience, as on these squares only can be placed points of observation, rest and embellishment. The play of lines on the edges of the streets and the enclosures, the tracks of the street-railways and the gutters, the plantations and the furniture of the square must be carefully considered and to the purpose, regulated but not constrained in order to be pleasing to the eye.

Geometry, art and nature must combine in forming the *toute ensemble.* Architecture and plantations, monuments and clusters of trees, water and green grass are opposites which enhance each other and furnish the best means of artistic square decoration.

T. M. Newton.

[The end.]



THE CHARACTER OF THE OLDER BUILDINGS STILL HOLDS ITS OWN. — THE NEW CITY-HALL. — THE *Times-Star* BUILDING. — THE TWO-STORY PLATE-GLASS AND IRON FRONT. — THE COMPETITION FOR THE UNIVERSITY COLLEGE.

THE dwellings of Cincinnati, during the last eight or ten years, show a marked advance over those of former years, and the same might be said of our churches, especially those of small capacity. But when we come to stores and public buildings, we can hardly lay claim to much advancement. We are hardly keeping up with other places in this class of buildings, and are not in advance of this same class of buildings erected in this city during the years from 1857 to 1862, as some of the finest buildings in Cincinnati were put up during those years and they still stand as monuments of good architecture. Some of the buildings especially referred to are those at the southwest and southeast, and the northeast corners of Vine and Third Streets; the Sinton Building on Vine and Baker; the Enterprise Building on Third near Vine; the Liverpool Insurance Company's Building, corner of Third and Main; Miller Building, corner of Third and Walnut; and a good many more that we might mention of the same character. These buildings gave to Cincinnati a name for good architecture that she still holds, and it seems strange that our later architects did not more closely follow the good examples then set in the matter of commercial buildings. Most, if not all, of the above were designed by James K. Wilson. These buildings do not, of course, compare with the modern sky-scrapers of Chicago, that is, when it comes to electric-lights, fast elevators and brass-buttoned policemen, as all these matters are of recent invention, and were unknown thirty years ago. Our Chamber of Commerce, corner of Fourth and Vine Streets, is one of the recent buildings and is considered by architects throughout the country as being one of Richardson's best buildings, and as he was happy in this kind of work, this building does and always will command the respect and admiration of competent judges in such matters. Mr. Richardson's architecture was essentially heavy, and he was, therefore, not as happy in dwelling-houses as he was in buildings of this class.

The new City-hall, recently completed, while a large and costly building, and certainly as fine a one as there is in the country when it comes to marble and such like and which was, moreover, put up with strict regard to economy, and has all the latest conveniences, is, nevertheless, hardly to be considered a strictly first-class architectural success. It is too much broken up and one projection hides another, so that one can see but a small portion of the building unless he keeps on the move. The different-colored stone of which it is built divides the building into pieces and minifies instead of magnifying the whole.

Contrast the color of the City-hall and Chamber of Commerce and the result is decidedly in favor of the latter. Then again, the City-hall lacks that dignity of character that should always attend a public building. Let the competent judge compare this building with the Boston Library, or the new Public Library about to be erected in Chicago, and he will at once see the lack of dignity of our City-hall.

It is not always the larger buildings that are the best specimens of architecture, for if you will leave the City-hall and go over to Sixth and

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Walnut Streets and take a view of the *Times-Star* Building, you will be greatly relieved in your architectural feelings by getting in contact with a really good specimen of street architecture, for this building is certainly one of the best of recent efforts, and is almost as good as anything that was erected during the blooming days of 1857 to 1862. But even the *Times-Star* Building has a serious defect in that the granite column on the corner is inside the line of the frieze that it supports, thus setting aside all precedent in Classic architecture.

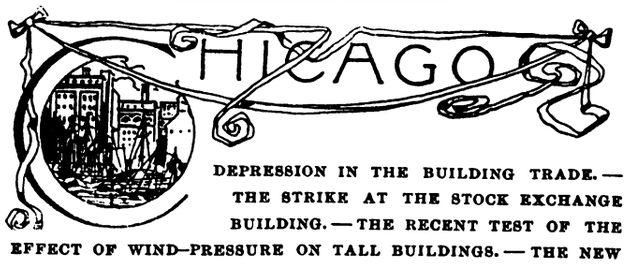
Cincinnati is perhaps the only city that has carried the two-story iron-front business to extremes in commercial buildings. If one visits New York or Chicago, he will find most of the finest stores are of enduring granite and very little or no iron showing on the fronts. The interior construction may be of iron or steel, but the outside of the wall is of granite, or something just as substantial, and this is after all the only true building-material. This is especially so in New York City, as can be proved by the Goelet Building, the Methodist Book Concern and numerous other buildings that might be mentioned. It is certainly not true architecture to take six or eight stories of solid masonry and hoist them up in the air on poles instead of solid masonry. The plea for this two-story iron business, is the need for light, more light; yet when the stores get all this plate-glass, about seventy-five per cent of it is curtained off with heavy blue curtains, thus shutting out the very light for which such great sacrifice has been made. A little more wall-space and a little less window-curtain would certainly aid our street architecture very materially. The European publications show they have not yet deviated from true architecture over there so far as to set their buildings up on props as we do: they still stick to the good old stone, and carve it, and beautify it, and make it a joy forever.

The amount of building done in Cincinnati is something over $5,000,000 *per annum*, and has been about the same for several years past, and though this is not a large showing compared with other cities, it nevertheless shows a steady healthy growth, and gives employment to over one hundred architects and draughtsmen and a great army of mechanics.

Cincinnati has made rapid strides in the matter of dwelling-houses, and no city in the country can make a better showing in this class of building. Other cities may have more of them, and more expensive ones, but they do not exhibit any more taste and judgment and skill than we do, and we do not understand why so many of our people go elsewhere to get their plans when they can be served just as well, or better, by home talent. The architect right on the ground is worth a great deal more than one a thousand miles away; he is at hand to take advantage of every little detail and to advise with the owner, and to direct the builder through the progress of the work, and another great and good reason for employing local talent is the fact that in no city in the country does so much depend upon suiting the house to the ground as in Cincinnati; no city has such beautiful sites upon which to build, and the owner who does not take advantage of all his surroundings will be a great loser.

The outlook is not very promising; there are more draughtsmen seeking employment now than at any time in many long years. We hear of no large contemplated improvements unless, indeed, it be the new University college which is to cost $100,000 and possibly $175,000 if the entire project is carried out. The architect for this building is to be selected by competition, and as the Board of Directors have acted upon good architectural advice, we may expect a very interesting and satisfactory competition, and as our local talent has a good deal of elegant leisure on hand just now, there will no doubt be a more than unusually large number of competitors after the persimmon, and each one will be sure that his is the longest pole.

[SINCE this letter has been in type the University competition has been decided in favor of S. Hannaford & Son. — EDS.]



DEPRESSION IN THE BUILDING TRADE. — THE STRIKE AT THE STOCK EXCHANGE BUILDING. — THE RECENT TEST OF THE EFFECT OF WIND-PRESSURE ON TALL BUILDINGS. — THE NEW LIFTING-BRIDGE AT HALSTEAD STREET. — PRECAUTIONS TO PRESERVE THE COLUMBIAN MUSEUM FROM FIRE. — THE WORLD'S FAIR PHOTOGRAPHS.

WE have reached the month in the latter part of which spring is supposed to make her advent, and thus we are fast on the heels of another season. With the change of season, however, the financial outlook does not appear to have materially altered. All manufacturing business here is at a low ebb. The uncertainty of the future of tariff and currency matters makes people extremely cautious about investing money in large building ventures, and at present most of the architects' offices are quiet and peaceful spots undisturbed by impatient clients or eager contractors. Certain firms who before the Fair employed as many as fifteen men have now very reduced forces. Among the different contractors it looks as if matters must have reached the mark of the lowest ebb, and the opinion as to how long they will remain there varies according to the disposition of the man. Some consider that even now there is some slight indication of affairs taking an upward turn. One of the large brick-makers is reported as saying, that where they formerly received nine dollars a thousand for the common grade of brick they were now receiving only five dollars, and that it was not probable that over fifty per cent of the brick-yards within the city limits would open this spring. He further stated that the union scale of wages, as fixed last year within the city, varied from thirty-one and a half to thirty-eight cents an hour. When the yards were closed last fall it was seen that these prices could not be continued, but no concessions were asked of the Union and none were granted. It is, however, expected that the organization will be sensible enough to offer to cut this spring, for at the former prices the yards would not be opened, as they could not be run without loss.

Among marble-workers things are rather busier, but the work at present is all on buildings which were begun before the advent of hard times and in which the marble contracts are the last ones to be filled.

It is the same with large paint firms — while the future is far from encouraging, all the present work belongs to old contracts. The general opinion among contractors is that the price of labor must come down and until it does in proportion to the price of raw materials there will be but little activity in building. The reduced cost of materials makes building estimates lower than they have been for years and should wages be correspondingly low, in spite of the financial depression the building interests would probably again revive.

In spite of the small demand for laborers, a strike has this month been going on in the half-finished Stock Exchange Building. It began with the carpenters though the other trades were, subsequently, ordered out and though the violence of the union men in a measure turned public sympathy from their cause, the strikers seemed most decidedly to have the right of the case on their side. From a statement prepared by the officers of the Carpenters' Council, the facts of the case seem to be these: In February, 1893, a contract was made with the Carpenters' and Builders' Association, going into effect April 3, to be in force for one year, by the terms of which the minimum rate of wages was to be forty cents an hour. This agreement the special contractor for the Stock Exchange Building signed. After the rush connected with the World's Fair buildings came to a close, the contractors began again to discuss the question of reduction of wages, and finally demanded that the men should submit to further arbitration. This was agreed to, and a committee representing the Carpenters' and Builders' Association decided that for three months the minimum rate of wages should be thirty-five cents an hour, union men to be allowed to work for any one who would pay this rate, but the clause relative to non-union men was to remain unchanged. The carpenters have all along claimed that by the decision of the committee wages were to be raised to the forty-cent limit at the end of the three months. They maintain that non-union men were employed, that wages were further reduced to thirty and even twenty-five cents, and that no strike was ordered, though at the limit of the three months no restoration of the old wages was offered. It is maintained that the contractors of the Stock Exchange Building were the first to violate the contract and, in fact, the whole strike seems to have been urged on by the alleged fact that these contractors have never kept to their agreements, though their original estimates on the building were made on a forty-cents-an-hour basis. Finally, the grounds that the committee took in actually ordering the strike was that twice there has been arbitration on the matter of wages and that twice the contractors have broken the compact made with the Carpenters' and Builders' Association. Such being the case, further arbitration seemed to be out of the question. The original contract of the forty-cents-an-hour wages had never been cancelled, and the thirty-five-cents-an-hour rate was only a concession to the times, the committee recognizing the general depression in money matters and hoping for better times at the end of the three months. When the contractors gave in to the demands of the strikers it was not that they recognized any right in the case, but only because of the insistance on the part of the architects of their living up to the time-contract which was of an iron-clad nature. It was more economical to give in to the demands of the carpenters than to risk forfeit under the time-contracts.

February was a month of blustering storms with us, wind and snow being the order of the day. During one storm when the wind moved at the velocity of eighty miles an hour, very interesting tests were made by Mr. W. L. Stebbings, civil and consulting engineer of the Monadnock Building, as to the stability of some of the tall structures. His report concerning the Monadnock Building was as follows: "The upper story of the Monadnock varied four-sixteenths of an inch at the north, which is constructed of heavy masonry and seven-sixteenths at the south end, which is a steel framework with light walls. The variations of the Pontiac was four-sixteenths of an inch and of the Old Colony three-sixteenths. These are the maximum variations on the north and south line, those on the east and west line being less. The spirit-level measures variations as small as five seconds. The three tests did not vary from each other one-sixteenth of an inch. The pressure of a gale blowing eighty miles

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an hour is about thirty-five pounds per square inch, and the buildings are constructed to sustain a wind-pressure of one hundred pounds." Mr. Stebbings further states, "I have made tests at my own house at different times. It is built of stone and only two stories high, and from what I know I am sure that it swayed at least twice as much during that storm as any of the big buildings."

An interesting feature in bridge building is, or will be, the Halstead Street lift-bridge. The river here is very narrow and the number of vessels at this point very considerable, so that when, two years ago, one of the large freight-steamers ran into the old bridge and demolished it, it was decided that a different kind of structure would be more desirable. The usual method of swinging the bridges here is on a central pier, placing the bridge when open parallel with the river and leaving a passage for vessels on either side of the pier. This, of course, in very narrow parts of the stream had most decided disadvantages and it was thought that if some kind of a lift-bridge could be used, by which the structure could be raised above the masts of the vessels, the most desirable structure for the place would be obtained. Accordingly, plans were asked for and in September, 1892, the special committee reported in favor of a counterpoised lift-bridge, and the Waddell lift-bridge was chosen by the Commissioner of Public Works. These plans had only a clearance for the bridge, when raised, of one hundred and forty feet, and objections were made by the Lake Carriers' Association on this score. Accordingly a new set of plans was prepared, by which there was a clearance of one hundred and fifty-five feet. After this delay the contract was let to the Pittsburgh Bridge Company. Another interruption to work soon came, for it was found by boring that at this point bed-rock was ten feet nearer the bottom than had been supposed and this would prevent piles of proper length. It was, therefore, decided to change the substructure plans from two round-ended piers resting on piles and grillage, with timbers connecting the piles and forming a base and envelope for the concrete, to four small, square piers, sunk to bed-rock with pneumatic caissons. The bridge now stands to-day with all the towers, sheaves and operating-cables up and connected. The trusses are coupled and suspended on cables, the false-work is out of the river and the floor of the bridge is being put down, and the approaches are all laid. The bridge is wide enough for four lines of wagons with two wide sidewalks and the river has a clear channel of more than one hundred feet between the abutments. When down it is fifteen feet above the water-line, and the mainmast of a vessel one hundred and fifty-five feet above the river will just clear the girders when the bridge is lifted. According to contract, the bridge must be lifted to its full height in fifty seconds. Two sets of cables are in place, one set of one-and-three-fourths-inch cables connect the span with the counter-weights, and the seven-eighths-inch cables lift the bridge. The operating-cables pass over sheaves six feet in diameter but the counter-weight cables pass over twelve-foot sheaves. Thus the engineering work is about completed, could be, in fact, in a few days, and the public are not wholly enlightened why the end is not yet. The contractors maintain that the funds from the city treasury are not forthcoming and they refuse to turn over the work to the inspectors till they are paid in full. On the other hand, the work is reported not to be all it should be and the city refuses to accept it till all the requirements are fulfilled. In the meantime, a certain district of the city is put at great inconvenience and the inhabitants thereof are loud in their complaints over what seem unwarrantable delays.

Soon after last month's letter was sent off, fire again broke out in Jackson Park, this time destroying the Colonnade, which formed a picturesque closing to the Court of Honor at the southern extremity. This pretty effectually ruins what was once the architectural pride of the World's Fair. Not very long after this, fire broke out in the Illinois Building and by this time people had become thoroughly aroused to the question, How and why do all the fires occur? The "tramp" theory has been practically abandoned, but though many others have been advanced no really satisfactory one has been offered. One result will be the sale, as soon as practicable, of the remaining buildings to contractors and dealers in old junk, as they appear to be entirely too dangerous to hold; in fact, proposals have already been formally advertised for them. Fears have been entertained for the safety of the Columbian Memorial Museum and precautions against fire have been redoubled around that. A special guard has been organized for the premises with Capt. G. M. Farnum as its head, and under him eleven First Sergeants from the Columbian Guard who made the best record during the exhibition for intelligence, courage and attention to business. The precautions against fire are almost funny. An old captain of the city fire-department has been called to Captain Farnum's assistance. He has under him seven picked firemen of the city fire-department and it is their duty "to slumber not, nor sleep," but to constantly and without interruption smell for fire. They do their cooking and eat, as well as sleep, in bunks in the building. Three of them are on duty in the daytime and all seven at night. Eight fire-plugs have been put into the building and one outside, three hose-carts are also in the place, each carrying three to five hundred feet of hose. There are also placed convenient for use a fifty-five-gallon Babcock chemical fire-engine on wheels, a twenty-four-gallon Miller chemical engine, similarly equipped, and twenty-eight Babcock hand fire-extinguishers. An equal number of Miller hand extinguishers have also been ordered. There are also distributed over the building, to extinguish any small blaze that may be discovered, one hundred and fifty buckets which are always kept full of water. These are placed on the radiators to prevent any chance of the water being frozen at a critical moment. No coal fire is allowed in the building, which is heated with steam from the outside, all oil, with the exception of signal-oil which is non-explosive, has been prohibited. All electric wires have been excluded with the exception of those used for the arc-lights which are absolutely necessary for patrolling purposes. The roof has been inspected and put in a good shape to resist fire; smoking around the building is prohibited and all of the inflammable rubbish in and under the building has been removed. The rats, which, as the other buildings became deserted, swarmed to this one, have had their full measure of attention. Twenty-five rat-traps are set all the time, which are the able assistants of one first-class rat-dog, two savage cats and two highly-educated ferrets. Consequently, if the Columbian Memorial Building, alias the World's Fair Art Gallery, is destroyed by fire, it will not be because efforts were not made to preserve it.

Absurd as it may seem, the official photographs are now coming to the front again and Mr. Higgenbotham is this time attacking the daily papers in behalf of his son and Mr. Arnold. Several of the Chicago papers have been issuing series of pictures of the World's Fair to be delivered to their subscribers on receipt of a certain number of coupons issued in their papers and an extra small amount of money. Certain St. Louis firms have also been issuing portfolios and those also are having suits brought against them by Arnold and Higgenbotham — two damage suits of fifty thousand each in the circuit court of St. Louis. Mr. Higgenbotham rises in indignation over the outrage and with the utmost generosity of feeling bemoans the loss to the Exposition Company through this infringement of the concession, while he nobly omits to mention (apparently even forgets) what personal loss there may have been connected with it. This defendant of the interests of the Fair states in an interview, that "Every view of the Fair that you see on the market is pirated, including the portfolios offered by the papers of Chicago and other cities, though not all are infringements. All the leading papers were granted permits last summer to send artists with cameras to take pictures for use in papers. These photographers would take one view for their papers and twenty for themselves, and that is where a great many of the views now on the market are coming from. We foresaw this would be the case and this is why we fought so strenuously against the granting of permits. We would willingly have furnished all the papers all the views they needed, but they seemed to think they would be deprived of some of their rights if they were not allowed to send photographers inside the gates, and they carried their point. But that practically made the photograph privilege valueless, and the large revenues that the Exposition would have derived from this source are thus lost." The men on the other side of the question, however, maintain that the photographs of the various portfolios were as honestly obtained as those of Arnold & Higgenbotham, they being obtained from enlarged kodaks, special-permit photographs, etc. The same firms further state that they made proposals to Arnold & Higgenbotham, but they found they could make so much more advantageous arrangements by collecting photographs from different sources that the Arnold & Higgenbotham arrangement fell through, meaning to the official photographers considerable loss, as they themselves state that these firms are "flooding the country with their views, and certain of them have been for months using a cart-load of paper a day." This is not wholly regretted by the public in general, for in this way most excellent views of last summer's beautiful fair are put within easy reach of many who must otherwise rely entirely on their memory to bring up glimpses of what will always be to them the most beautiful sight of their lives.

The Chicago Society of Artists has now on the walls of its rooms its black-and-white exhibition. A good deal of excellent work is found among its exhibits. The Cosmopolitan Club has an exhibit at the Art Institute next week, and at its close the Spring Water-color Exhibition will be the attraction.

The Chicago Society of Artists is beginning to be the centre of an artistic circle, which, heretofore, has been entirely wanting in our city. The club numbers, besides its active members, artists and architectural draughtsmen, many honorary members, men who are not artists, but whose artistic tastes incline them to an appreciation and patronage of art. The Club gives suppers and dinners occasionally, at which all the members meet to strengthen the artistic bond with an extra bracing of those of good fellowship. The last festivity was a *rouge et noir* supper, in which the black and the red was thinned with punch and toned down with tobacco smoke. Fun, songs and speeches were the order of the night and red carnations, red neckties, red tablecloths and red lamp-shades were the proper decoration for the animate and inanimate. Thus Bohemia regales herself and seems at last to have taken her place here in our city among the other orders of society.

A good deal of interest has been taken during the last month in statements which have been made by a Mr. Gathman, amateur optician, astronomer, scientist and inventor, living here on the North Side. He claims to have discovered a method of constructing telescopes which will materially lessen their cost, while, at the same time, as one of the papers puts it, their power will be so increased that we shall be able "to see the inhabitants of Mars, or to pick up a pin on the moon." Naturally there are many scoffers at this statement, but that is always the case with any great invention, and Mr. Gathman is only waiting to secure his patent rights

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from Germany and America before making his great discovery public. If his telescope proves to be able to accomplish what he maintains it will, we shall soon be studying the architecture of Mars with interest, and, perhaps, drawing inspiration from some of its styles.

COLONIAL WORK IN THE GENESEE VALLEY.

FIRST ARTICLE.



The Old Rochester Market; now destroyed.

IN all America there is hardly to be found a fairer or more fertile region than that part of New York State embraced in what is known as the "Phelps and Gorham purchase" — the "park-like Genesee Country," as Mrs. Van Rensselaer has most felicitously called it. The Senecas, whose villages and yellow cornfields once lay thick on either side of the broad, fordable river, gave it the name of the Beautiful Valley, and surely none could be more fitting.

Rising in the precipitous region south of Portage, the Genesee, in its first miles, pursues a tortuous course between narrow banks, until, in the vicinity of Mount Morris (whose Indian name meant "where the river forsakes the hills"), it enters a broad, undulating country, part clear, part wooded, and gemmed by many crystal lakes. At Rochester it attains the level of Ontario by means of two high cataracts, and for the remaining few miles of its course flows slowly and soberly between the confining walls of the famous gorge of the Genesee.

The beautiful country drained by this noble river has been, from the earliest times, a favorite dwelling-place of man. The prehistoric race of mound-builders have left many and unmistakable traces of their occupation, especially in the vicinity of Irondequoit Bay (which the Indians called Teoronto, "the place where the waves gasp and die"). Immeasurably later, but still far in the past, it was the centre and stronghold of the Iroquois nation — those Romans of the ancient American world. The first white faces that appeared to them there came probably from France — devoted Jesuit missionaries and adventurous *couriers du bois*, to whom the region of the Great Lakes, even beyond the Mississippi, was already familiar ground when, by the Dutch and English on the coast, all west of Albany was still referred to as the "great unknown country." The French, however, never made secure their foothold on these shores, and it was, after all, the English who, by purchase and treaty, supplemented by a liberal and judicious use of fire-water, dispossessed the aboriginees and, in the slow course of time, evolved the average American of to-day.

The Falls of the Genesee, situated as they are between the Hudson River and the great cataract of Niagara (to which they are a hardly inferior spectacle), have in the past attracted many illustrious visitors. Louis Philippe with some members of his court followed the Indian trail from Canandaigua to the falls; Aaron Burr stopped there on one of his western journeys, and in later times came Webster and Lafayette and a host of others, drawn not now by the falls themselves, but by the city that had grown upon its brink. So singular is the law which governs posthumous greatness, the only two individuals connected with the locality whose names shine with sufficient lustre to pierce the darkness of obscuring years, are a

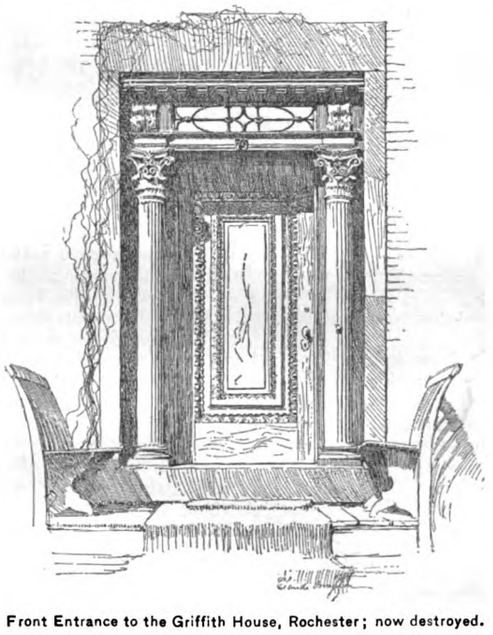


Front Porch of the Smith House, Brighton.

low-born semi-savage, Mary Jemison, "the white woman of the Genesee," who, by remaining true to her race and loyal to her adopters, rendered inestimable service to the cause of civilization; and a gin-drinking mountebank, Sam Patch, who in his last utterance enriched the language with a new catch phrase, "Some things can be done as well as others," and jumped to his death from the upper falls in the presence of a crowd of horror-stricken spectators.

Of the present condition and aspect of the Genesee Country it is almost superfluous to speak. Rochester, though not the oldest, is the largest city, the centre of what is said to be the richest agricultural district in the world. At the Western New York State Fair, held there annually, the impossible pictures of fruit and stock and poultry, made familiar through the columns of the *Homestead* and *Henhouse* and similar publications, come near to being realized — dogs with blood in their eye, chickens with whiskers on their legs and pigs so fat their feet have become mere rudimentary appendages, far up their sides. Rochester is also noted for its nurseries and fine collections of orchids, chrysanthemums and other flowers; and the many famous stables and kennels in the city and up the valley annually send representatives to metropolitan horse and bench shows.

At Genesee, Mount Morris and vicinity, there exists a condition of things common enough abroad, but rarely found in America, a sort of enlightened feudal system, the land being almost exclusively owned by a few individuals, hereditary holders, who, instead of leaving its management in the hands of unscrupulous agents and living elsewhere on the desired revenue, plant themselves squarely in the centre of their own acres and identify their interests with those of their tenants. The life of the people of this class is not unlike that of the English country gentleman; their work consists in the management and improvement of their land, the bettering of the condition of the farming population and the breeding and maintaining of thoroughbred animals, preëminently the horse. Their relaxation is found in the entertainment of guests, the exchange of visits and, more than all else, fox-hunting in its season. Once every



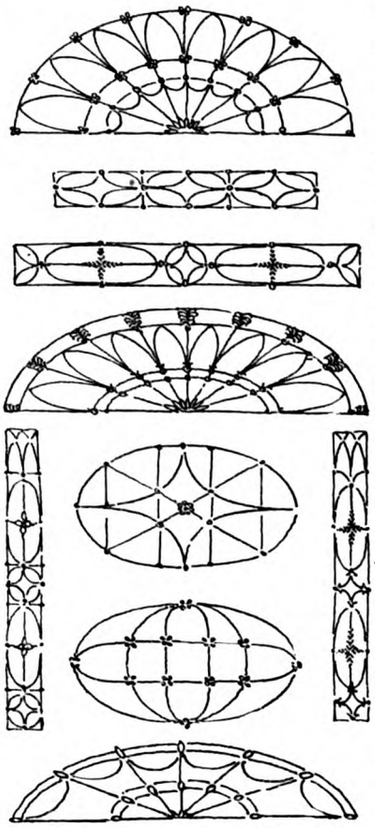
Front Entrance to the Griffith House, Rochester; now destroyed.

year, lured by the Genesee Valley Hunt, one of the most famous in the country, "Society" comes farther westward than is its wont, and finds in the autumnal splendors of the valley a rival to its own Berkshire Hills. Mention must be made, also, of another class whose presence colors — or discolors — the social life of several of the villages — invalids, who, seeking to renew their health from springs famous since Indian times for their medical properties, are rested and often restored by a residence in so fine a climate, amid such beautiful surroundings. The mingling of these various elements render the summer life of the valley quite distinctive, so that the curious stranger, looking from the car window, expecting to see only representatives of the rural population waiting for the incoming train, is quite as likely to be greeted by the sight of smart traps and liveried servants and well-groomed men and women surrounded by all that they can muster of the pomp and circumstance of wealth.

I have delayed thus long in coming to the subject of the Colonial architecture of this region, because there is so little to be said, and because drawings say that little so much more completely than words. So far as I have been able to gather, from research and observation, what Colonial work the valley contains derives more from the South than from New England, which is accounted for by the fact that the first settlers came from Maryland. Many of the very oldest houses exhibit a central mass flanked by two low wings, and often a pillared portico in front (not to be confused with the Greek-temple type of a later day), two features common in Southern Colonial work, but rare in Eastern. The details, too, incline to heaviness rather than to that extreme delicacy one sees in Salem and Portsmouth houses. A Dutch influence, derived from Albany and New York, the then nearest large cities, may be seen in many of the old doorways and in "spindley" mantels with fan-shaped ornaments. The architecture here passed through the same

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phases as elsewhere throughout the country; an increasing heaviness and coarseness led at last to the adoption of Greek ornament and proportioning more and more slavishly adhered to, and this ended in the unrelieved hopelessness of "carpenters' Classic."



Leaded-glass Forms, Rochester, N. Y.

Of Colonial architecture, properly so called, Rochester affords few examples such as may once have existed, having been demolished to give place to new work. There remain, however, scattered throughout the city many beautiful doorways, cornices and other bits of detail and leaded glass-work of fine design, in variety and profusion. In the older residence sections there are some good houses dating from that period when the Greek influence was beginning to supplant the Palladian, and I have chosen for illustration a doorway from one of these, the Nehemiah Osborne house (now owned and occupied by the Security Trust Company), which, though not strictly Colonial, is yet a most original and beautiful application of Greek ornament to American conditions.

In Canandaigua there exist conditions more favorable to the preservation of its past architecture and it is accordingly rich in good material left by the ebbing tide of prosperity. The village, situated on the shore of the lake of the same name, is one of the oldest in the State and was long regarded as the farthest outpost of civilization. It was here, in the summer of 1788, that the Phelps and Gorham purchase was consummated, on which occasion Red Jacket, surrounded by his fellow-warriors, poured out Indian eloquence surcharged with references to wrongs suffered at the hands of the pale faces, sufficient to have filled volumes of "*Fourth Readers*," but without perceptible effect, since, when the meeting ended, over two million acres of the land had passed into the indisputed possession of the oppressor. Canandaigua thereupon became the centre of new activities. A land-office, the first in America, was opened by Mr. Phelps, for the sale of the land to settlers, who shortly came swarming from the east to buy and occupy it. Early in the town's history, Louis Philippe, escaping from the storm which rocked the thrones of Europe, settled in Canandaigua with a few followers, and, in the heart of a virgin wilderness, inhabited by fierce, and sometimes hostile savages, established a toy court over which he ruled, a make-believe monarch.

The village consists mainly of one street, but that is a magnificent one, lined and intersected by long rows of large trees. The houses, old and stately, set far back and far apart, each in the centre of well-kept grounds. The tone of the place is eminently aristocratic and this is enhanced by the existence of two large private schools, the Granger Place Seminary for girls and the Fort Hills Academy for boys, each occupying old and interesting buildings. In the Granger Place School there are a few exquisite examples of Colonial furniture and several fine mantels, one of which is shown herewith, and another, more elaborate, Frank Wallis has embodied in his book on Colonial architecture.



The Livingston Park Seminary, Rochester, N. Y.

Perhaps the most pretentious house in the village is the Grey mansion, designed by an English architect early in the present century and built by English workmen imported for that purpose. Seen, as I saw it, just at dusk on a winter day, untenanted, in the midst of vast, desolate and gloomy grounds, it was the most forbidding human habitation conceivable, and this impression was intensified a hundredfold by an inspection of its interior — following the old custodian from one great echoing room to another by the light of a single oil-lamp. The finish, with the exception of a couple of bedroom mantels, is hideous. A spiral stairway of solid mahogany extends from the basement to an observatory on the roof, from which a fine view of the lake and the surrounding country may be obtained. My guide told me that the house contains more than sixty rooms and I could readily believe it, for it is practically four stories high, and correspondingly large in extent. Whether the place is haunted or not I do not know, but it haunts me still. There certainly never was a house offering more conveniences to ghosts of moderate means in search of suitable apartments. Perhaps I intruded on the privacy of some of the guild, for I have since heard a dark story about some events which once transpired there, in which figured a padded-chamber and other regulation "props."

I will not repeat it here, since it may not be true, and its recital might give offence to persons still living.

Claude Fayette Bragdon.

[To be continued.]

Societies

American Institute of Architects.

The next meeting of the Executive Committee of the American Institute of Architects will be held in Chicago, on Tuesday, April 3. Applications for membership, or other business to be brought before the Committee, should be sent to the Secretary in Providence, so as to reach him by March 31; or to him at Chicago, care of Mr. D. H. Burnham, the Rookery, after that date.

Alfred Stone, *Secretary.*

Worcester Chapter, American Institute of Architects.

The regular monthly meeting of the Worcester Chapter of the American Institute of Architects was held at the Board of Trade rooms last week. The officers were appointed a committee to report to a special committee of the American Institute the Chapter's views regarding a revision of the present relations of the individual Chapter to the Institute.

Illustrations

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

First Baptist ["Brattle Square"] Church, Clarendon Street, corner Commonwealth Avenue, Boston, Mass. Gambrill & Richardson, Architects.

[Gelatine Print, issued with the International and Imperial Editions only.]

Colonial Work in the Genesee Valley: at Canandaigua, N. Y. Measured and drawn by Mr. Claude Fayette Bragdon, Architect, Rochester, N. Y.

[Issued with the International and Imperial Editions only.]

See article elsewhere in this issue.

Colonial Work in the Genesee Valley. Measured and drawn by Mr. Claude Fayette Bragdon, Architect, Rochester, N. Y.

[Issued with the International and Imperial Editions only.]

Entrance to Banking-room, Paterson, N. J. Mr. Charles Edwards, Architect, Paterson, N. J.

[Issued with the International and Imperial Editions only.]

A Suburban Cottage near Washington, D. C. Mr. Waddy B. Wood, Architect, Washington, D. C.

This cottage, in which no plumbing is required, will cost according to the bids received $1,400. The interior is finished in white wood with sand-finished plastering in dining-room, hall and parlor. Pebble-dash stucco is used for a portion of the exterior.

Old Colonial Work in the Genesee Valley: at Rochester, N. Y. Measured and drawn by Mr. Claude Fayette Bragdon, Rochester, N. Y.

See article elsewhere in this issue.

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MOTIVE FOR A FOUNTAIN. MR. THEODORE BAUER, SCULPTOR, NEW YORK, N. Y.

THIS model was shown at the last exhibition of the Architectural League.

OLD HOUSE AT LE MANS, FRANCE.

[Additional Illustrations in the International Edition.]

A PORTION OF THE ARCHITECTURAL CASTS FROM THE PALAIS DU TROCADÉRO, EXHIBITED IN THE ART BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL.

[Gelatine Print.]

EAST FRONT OF THE FRENCH GOVERNMENT BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. M. RENÉ DUBUISSON, ARCHITECT. MM. H. P. MOTTE & R. A. DUELLE DECORATORS.

[Gelatine Print.]

PARIS CHURCH, HAMPSTEAD, ENG. MR. F. P. COCKERELL, ARCHITECT.

THE CHURCH HOUSE, STOURPAINE, BLANDFORD, ENG.

VILLAGE CLUB, WALTON-ON-THE-HILL, SURREY, ENG.

LONDON AND SOUTHWESTERN BANK, HIGHGATE, LONDON, ENG. MESSRS. TRUEFITT & WATSON, ARCHITECTS.

THESE premises, consisting of a bank and shop adjoining, are now in course of erection for the directors of the London and Southwestern Bank, Limited. The lower portion of the front elevation of the bank is in white Mansfield stone, the upper portion being in red brick with stone dressings. The ground-floor is devoted to the banking business and consists of a banking-chamber, with manager's room, etc., adjoining. The fittings are in teak. The strong-rooms occupy the basement and are fitted with iron grilles and fireproof doors. The upper floors of the building are arranged for the manager's residence. The building throughout is fitted with electric-bells and every modern appliance.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

THE STAINING OF LIMESTONES BY CEMENT.

NEW YORK, N. Y., January 20, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Can you tell me whether there are any natural cements, either the inexpensive Portland or the Rosendale, which can be used with Indiana limestone without staining it? It may be of interest to you to know that I have received an answer to a similar question from the Union Akron Cement Works at Buffalo who make a natural cement which in strength is equal to a fair quality of Portland, and they claim that their cement does not stain limestone and refer to a church built in Buffalo, but I have not been able as yet to properly verify the statement.

Yours very truly, GEORGE HILL.

BOSTON, MASS.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — I have taken a good deal of time to answer your question in regard to a natural cement mortar in the setting of limestone. This delay is because I have been among the architects, as I could find the time, to learn their experiences in regard to this matter, and all that is known here reduces itself to this:

To avoid stains appearing on the surfaces of limestone, no natural cement must be used, and no artificial cement with the exception of Lafarge.

In all careful work Lafarge cement is specified, and as stains come through the whole thickness of the limestone, it is usually specified that the front four-inch facing of the brick backing be also laid in Lafarge cement. In some cases, the backing built with common cement is simply plastered over with Lafarge and the limestone set against this.

In certain cases, when the supervision has been untiring, the results have been satisfactory. In others with the same specification, the results have been the reverse, which has been considered due to the carelessness of the workmen in not covering entirely the common cement with the Lafarge.

The only safety from stains as coming from the methods of construction, is to use pure lime mortar for the entire wall.

Finally it has been generally noticed that in the course of time, the stains disappear more or less. Yours,

F. W. CHANDLER.

ENGLISH TRANSLATIONS.

FARGO, N. D., March 1, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Is there an English translation of Viollet-le-Duc's "*Architectural History*," and if so, by whom published, and what price? I would also ask the same information in regard to Planat's "*Encyclopédie*," A translation of the latter, I am aware, has been appearing in your valued paper, but I wish to know if it can be procured in book form in English.

A reply through the columns of the *American Architect* will be esteemed a favor by Yours very truly,

WALTER B. HANCOCK.

[No complete English translation has been made of the "*Dictionnaire Raisoné de l'Architecture Francaise*," but translations of certain articles in it have been published in the *American Architect* and other journals. English translations of the "*Entretiens sur l'Architecture*" have been translated, and so, too, have the "*Annals of a Fortress*," the "*Story of a House*," the "*Habitation of Man*" and the "*Young Designer*," but we are given to understand that all of these translations are now out of print and can only be found now and then in the second-hand stores. Planat's valuable work has not been translated, except the copious extracts in this journal. — EDS. AMERICAN ARCHITECT.]

WHITE PINE POSTS: A CORRECTION.

BOSTON, MASS., March 21, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — The note in parenthesis near the end of my article on "White Pine Posts," published in the *American Architect*, March 10, 1894, should read: "[It may be noted that, from the above formulas, white pine and spruce are worth about 20 per cent less, *in pure compression*, than yellow pine and oak.]"

JAMES H. STANWOOD.

NOTES AND CLIPPINGS

THE R. I. B. A. GOLD MEDAL, 1894. — The President of the Royal Academy of Fine Arts has been chosen by the Council of the Institute as the recipient of the Royal Institute of British Architects' Gold Medal this year. The announcement made from the chair at the Conduit-street meeting on February 12, was received, as a matter of course, with hearty applause, for Sir Frederic Leighton, P. R. A., is not only one of the most accomplished men of the day, but he enjoys a popularity as complete as it is deserved. The fact, nevertheless, remains, that a considerable number of members of the R. I. B. A. entertain a conviction that the choice thus made by the Council has been arrived at with a view to ulterior aims, their vote being cast, it is said, somewhat cringingly, perhaps in the hope of securing a more visible recognition at the Academy, where architecture has hitherto been more or less systematically ignored. The honor, if it be one, is certainly of no moment to such a distinguished person as the President of the R. A. The late William Burges's cynical suggestion, that the members of the Artists' Corps should shoot in rotation for the Institute Gold Medal, is likely to be well remembered, but we suppose, while such men as Cockerell, Donaldson, Gilbert Scott, Viollet-le-Duc, Street, Waterhouse, Pearson and Butterfield have accepted the medal, other architects may well consider it as a desirable recognition at the hands of their fellows. Professor Ruskin and Mr. Norman Shaw declined the tendered prize with warmth mingled with disdain. This time, in the ordinary course of events, an English architect should have been chosen for the R. I. B. A. Gold Medal. Last year it went to Mr. R. M. Hunt, of New York, and the year before the late M. César Daly was selected. Since the choice of the Council for 1894 has been known to be settled upon a painter, not a few architects have questioned the wisdom, not to say justice, of this selection, and we should not be surprised to hear that another candidate had been proposed under the provision of the by-laws. Several, whose admiration for the President of the Academy is unquestionably sincere, admit that other and more suitable recipients of the medal ought to have been recognized, and some may test the question by the popular vote, as contemplated under the charter. The Council's nomination will have, of course, to be confirmed. It is, after all, one of the things that few people trouble themselves much about. — *Building News.*

PNEUMATIC TUBES IN CHICAGO. — A pneumatic-tube service between the offices of the various newspapers and news associations of Chicago has just been put in operation. Twenty-nine conduits were laid under Clark Street, beginning at Jackson and running north, and branching off at cross streets leading to their respective destinations. These conduits consist of seamless drawn-brass tubes, two and seven-eighths inches in diameter, laid in square vitrified-clay pipes, surrounded by about ten inches of Portland cement. In this way all dampness is avoided In sending the carriers through these tubes only the pressure

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of the atmosphere will be used, the necessary vacuum in the receiving end being produced by an ejector. The carrier is made of flexible leather, with an inner spiral frame to keep it in shape, and a band of felt around each end to make it comparatively air-tight. It is two and three-fourths inches in diameter and eight inches long. This system connects the City Press Association and the Western Union Telegraph offices, at Jackson and Clark Streets, with the offices of the different newspapers, national and international news agencies and the central police-station. About one minute is required for a carrier to traverse the longest line. Several years ago the principal newspaper offices in this city were connected with the Western Union Telegraph Office by pneumatic tubes. — *Scientific American.*

Fire-escapes on Hotels. — The full bench of the Supreme Court of Massachusetts, says the *New York Times*, has rendered a decision respecting fire-escapes in a suit brought against the owners of a burned hotel in Boston, in which it says: "Whether proper means of egress or other sufficient means of escape from fire are provided in any hotel is necessarily a matter upon which men may differ in opinion, and we are of opinion that it was not the intention of the Act to leave it to a jury to determine after a fire whether there were proper ways of egress or sufficient means of escape. We think that the intention was that the Inspector [of buildings] should decide this question and that only after the Inspector has decided it and has given notice in writing, specifying what additional ways of egress or means of escape from fire are, in his opinion, necessary, and the owner, lessee, or occupant has neglected or refused to comply with the order of the Inspector, can it be said that the owner, lessee, or occupant has violated the provisions of the Act concerning proper ways of egress or means of escape from fire. . . . In no event is the sufficiency of the ways of egress or means of escape from fire to be determined by a jury; the question for a jury, so far as proper ways of egress or means of escape are concerned, is whether the defendant has complied with the written directions of the Inspector, or with these directions as modified on the application to the Superior Court."

Recent Church Tower Accidents. — The following extract from a private letter is worth putting on record: The fine old church of St. Mary's, Shrewsbury, has been irreparably injured, the spire, rising to a total height of 222 feet, having been blown down and fallen right through the roof, utterly destroying the fine timber openwork, so characteristic of our later Gothic. My nephew, who returned a day or two since from Germany, was witness of an extraordinary scene. Whilst at Stettin, he was looking out of his hotel window; above the roofs of the opposite houses he could see the tower of the old church called the Jakobi Kirche, built in the eleventh century. When the town was besieged by the Brandenbergers, in 1677, the spire was injured by a shot and fell through the roof; the church was then virtually rebuilt. The tower and spire were recently observed to be cracked and were surrounded with scaffolding. He turned his head away for a moment; there was a loud crash and returning to the window, tower, scaffolding and all had disappeared! One man was killed; it is fortunate that the loss of life was no greater. The tower had fallen right through the roof and the church is a ruin.

Drinking-water in Persia and Cholera. — It is easy enough to understand why Persia is a hot-bed for cholera. The only wonder is that it should ever be free from that plague. Here is an extract from a recent report of the British Consul at Resht, a town of 40,000 inhabitants: "The cesspools that exist in each house are mere wells, more or less deep, which have no exit. Drinking-water is obtained from wells sunk within ten to twenty yards of these cesspools. There are no sewers, and although gutters exist in some streets, they are worse than useless, for they have no means of carrying away the accumulated water, and, consequently, they are oftener than not full of a stagnant green liquid. The rubbish out of kitchens, and stuff that goes into the dust-bin at home, here is thrown out in certain corners of streets and open spaces, where it is allowed to accumulate. Ponds have been artificially made where water out of the gutters accumulates, and when in winter it freezes, this filthy, muddy water is turned into ice and collected in the ice-houses for consumption the following summer." — *N. Y. Evening Post.*

Paint for Ironwork. — The amount of paint for ironwork may be estimated by the following rule, given in the last annual report of the City Engineer, Horace Andrews, of Albany, N. Y., on the authority of Chief Engineer T. J. Swift of the Delaware and Hudson Canal Company. This rule calls for five-eighths of a gallon of paint for each ton of iron for the first coat, and three-eighths of a gallon a ton for the second coat. The entire cost of repainting a 700-ton bridge in Albany was found to be $2.78 a ton, and the amount of paint purchased for the purpose in accordance with the above rule was found to leave a surplus of fifty gallons of the first coating and eight gallons of the second. — *The Engineering Record.*

Uses of Lumber. — For what is the greatest amount of lumber used? Nine people out of ten will say for houses and buildings. It is doubtful if 35 per cent of the lumber output goes into buildings. The railroads, farmers, and miscellaneous purposes take about 40 per cent, and the other 20 per cent goes into boxes. This estimate is made on the judgment of some of the oldest and best informed lumbermen in the country. — *Northwestern Lumberman.*

Large Concrete Arch. — A Portland-cement concrete arch lately built over the Danube at Munderkingen, Wurtemberg, has a span of 164 feet, a very large one for this or any other material. — *N. Y. Tribune.*

Penny-in-the-slot Gas-fires. — The "penny-in-the-slot" system of gas-supply is now being extended to gas-fires. The question of fires in hotel charges is a vexed one, and the solution of the difficulty which has been made in the case of a Liverpool hotel is one which will no doubt meet with approval of those frequenting it. The hotel in question has had a penny-in-the-slot gas-fire on trial in one of its bedrooms for about twelve months, and has now, it is stated, decided to fit up the whole of its bedrooms in the same way, so that the occupant of the room can have a fire whenever he wishes by placing in the meter a number of pennies equal to the number of hours he wishes to have the fire burning. — *Industries and Iron, London.*

An Imported Steamship Launched on Lake Titicaca. — A triumph in engineering is reported from the mountains of Peru, where a twin-screw steamer of 540 tons, 170 feet long and 30 feet wide, has been successfully launched on Lake Titicaca, the highest navigable waters in the world, more than 13,000 feet above the sea. This steamer, which belongs to the Peruvian Government, and is to be used for freight and passenger traffic, was built on the Clyde, then taken apart in more than a thousand pieces and shipped to Mollendo by sea. It was then carried to Puno by railway and transported over the mountains on the backs of llamas and mules and put together by a Mr John Wilson, a Scotch engineer, with great skill and success. — *Chicago Record.*

Characteristics of Various Woods. — It has long been known that certain woods possessed capabilities fitting them for particular classes of work; but a concise table of collected data on this point will be found useful. The woods noted for *Elasticity* are: Ash, hickory, hazel, lancewood, chestnut (small), yew, snakewood. *Elasticity and toughness:* Oak, beech, elm, lignum vitæ, walnut, hornbeam. *Even grain (for carving or engraving):* Pear, pine, box, limetree. *Durability (in dry works):* Cedar, oak, poplar, yellow pine, chestnut. *Furniture:* Beech, birch, cedar, cherry, pine, whitewood. *Best furniture:* Amboyna, black ebony, mahogany, cherry, maple, walnut, oak, rosewood, satinwood, sandalwood, chestnut, cedar, tulipwood, zebrawood, ebony. *Building (ship-building):* Cedar, pine (deal), fir, larch, elm, oak, locust, teak. *Wet construction (as piles, foundations, flumes, etc.):* Elm, alder, beech, oak, plane tree, white cedar. *House building:* Pine, oak, whitewood, chestnut, ash, spruce, sycamore. *Machinery and millwork (frames):* Ash, beech, birch, pine, elm, oak. *Rollers, etc.:* Box, lignum vitæ, mahogany. *Teeth of wheels:* Crab-tree, hornbeam, locust. *Foundry patterns:* Alder, pine, mahogany. — *Illustrated Carpenter and Builder.*

Street-cleaning in a Mexican Town. — "It is not often a man is a witness to burning streets in a town, but I had that pleasure a few days ago," said G. W. Douglass, of El Paso. "The citizens of the village of Las Cruces, N. M., are in the habit of grading their streets with the accumulations of barn-yards. They had done this till the sand, dust and manure had become thoroughly mixed, the manure predominating. It seldom rains in that part of the country, and the manure was dry as powder. From some cause it caught fire in the western part of the village, just as one of New Mexico's typical sandstorms was rising. The wind soon became a strong gale, and the fire spread rapidly. In less than twenty minutes the whirling wind had carried the fire into all parts of the main streets, which had been graded with stable stuff. Dense clouds of smoke rolled over the buildings and out on the plains. The whole heavens were darkened, and it was a grand sight to see the great columns of smoke, fire, sand and dust surging, whirling and darting away toward the mountains. Had the town not been built of mud it would certainly have been destroyed. The storm swept the streets of all barn-yard grading material, and the Las Cruces villagers will have to re-grade as material accumulates." — *St. Louis Globe-Democrat.*

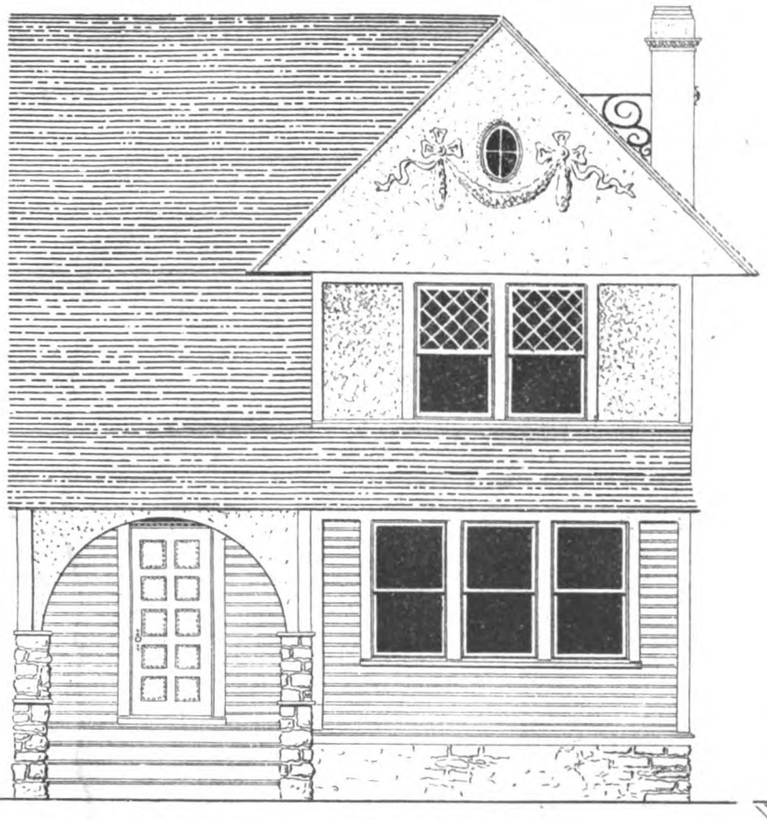
An Englishman on American Architectural Progress. — Perhaps the chief sign of progress in the domain of art in America is seen in architecture. It is probably no exaggeration to declare that the United States possesses more fine specimens of modern architecture, both in city and country, than can be found in any other part of the world. The average may be inferior to that of Europe, but the good is better. The wearisome monotony of Parisian streets, and the excessively ugly rows of brick houses, plain to a degree, without even a cornice, which line whole squares even in the fashionable quarters of London, would be looked for in vain in American cities. Hundreds of country houses in France, particularly in the south, which are known by the high-sounding title of Château This and Château That, would not be accepted as the barns or stables of any of the artistic stone, brick, or wooden mansions scattered over the American continent, especially in the vicinity of towns. The admirable work of transatlantic architects does not always stand out so prominently as it should, because it is too often lost in an ocean of surrounding cheapness. Mean frame-houses are still too frequent even in the metropolis, and poor, low specimens of masonry sometimes dwarf a veritable monument, much as was the case with the Tour Saint Jacques and Notre Dame before the advent of Napoleon III and Baron Haussmann. Thirty or forty years ago Broadway fronts were of marble. Then came a period when iron was employed both inside and outside, Stewart's store being, perhaps, the finest example of the use of this material. But to-day, bricks of various colors, forms and qualities, terra-cottas and stone of many sorts give greater variety to façades. Fortunately, a stop has been put to the "brownstone front and high stoop" style of dwellings. It may be that the new houses are a trifle too rococo. English visitors, accustomed to the severe simplicity and leaden hues of London, are sure to find them so. But that the residential quarters of American cities, great and small, will bear comparison to-day with those of European cities, cannot be questioned; and, if we turn to the larger structures used for business and trade, the like of them is rarely seen outside of New York, Chicago and Boston. — *Theodore Stanton in the Westminster Review.*

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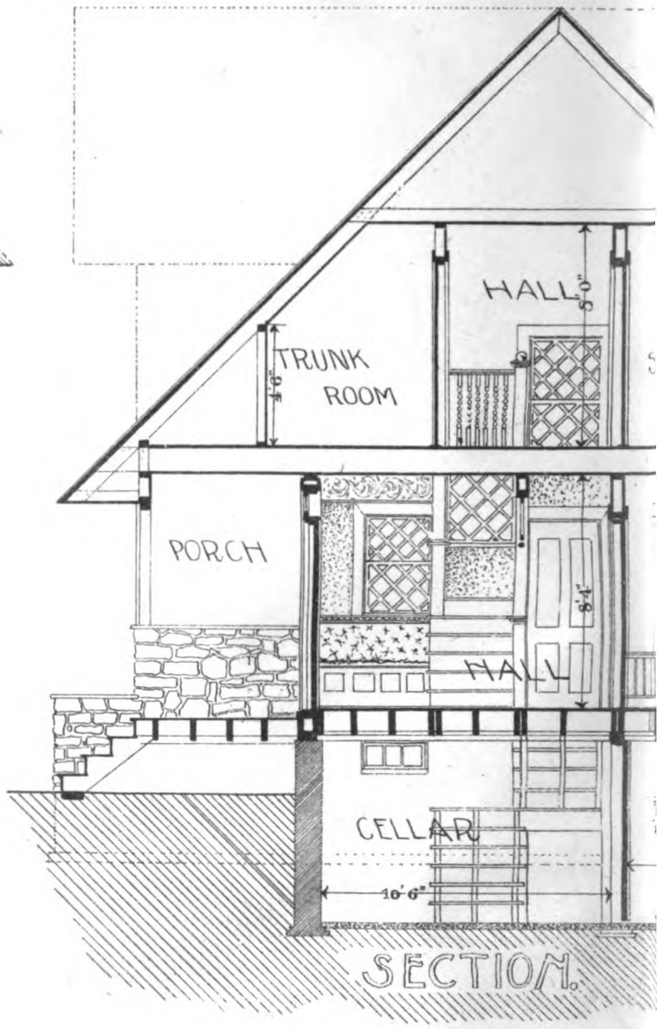
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FRONT ELEVATION.



SECTION.



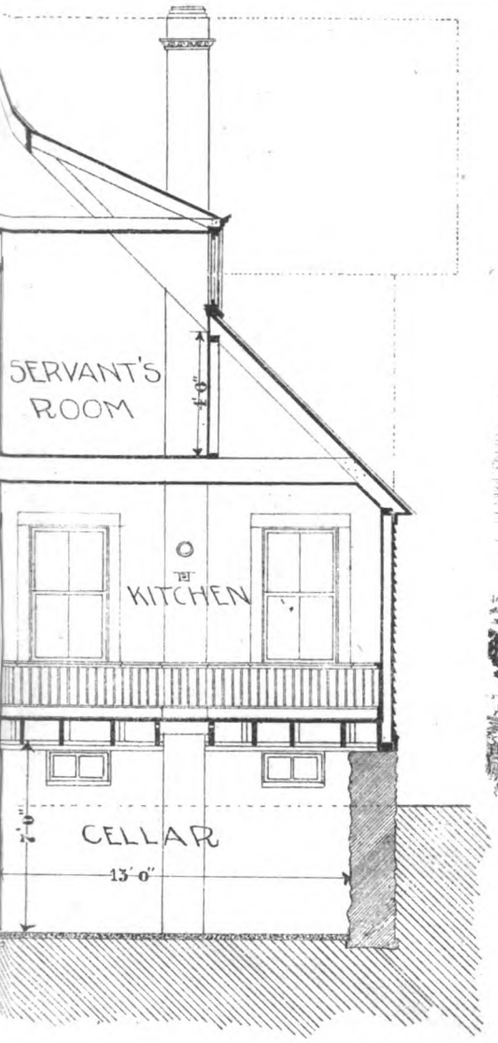
VIEW OF HALL IN SUBURBAN COTTAGE.

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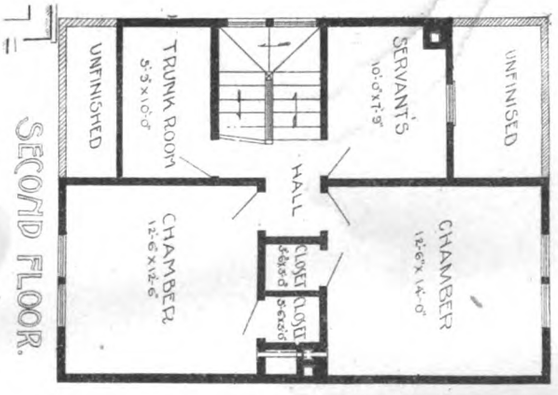
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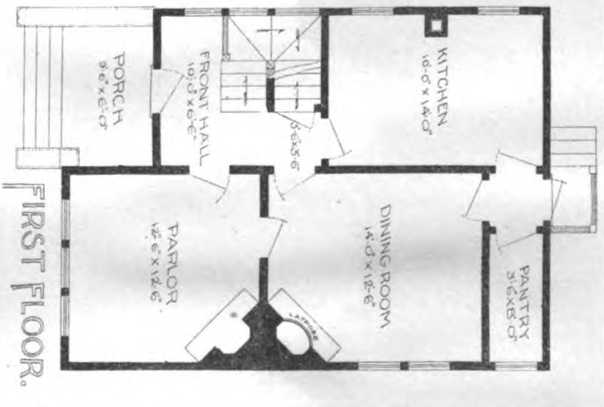












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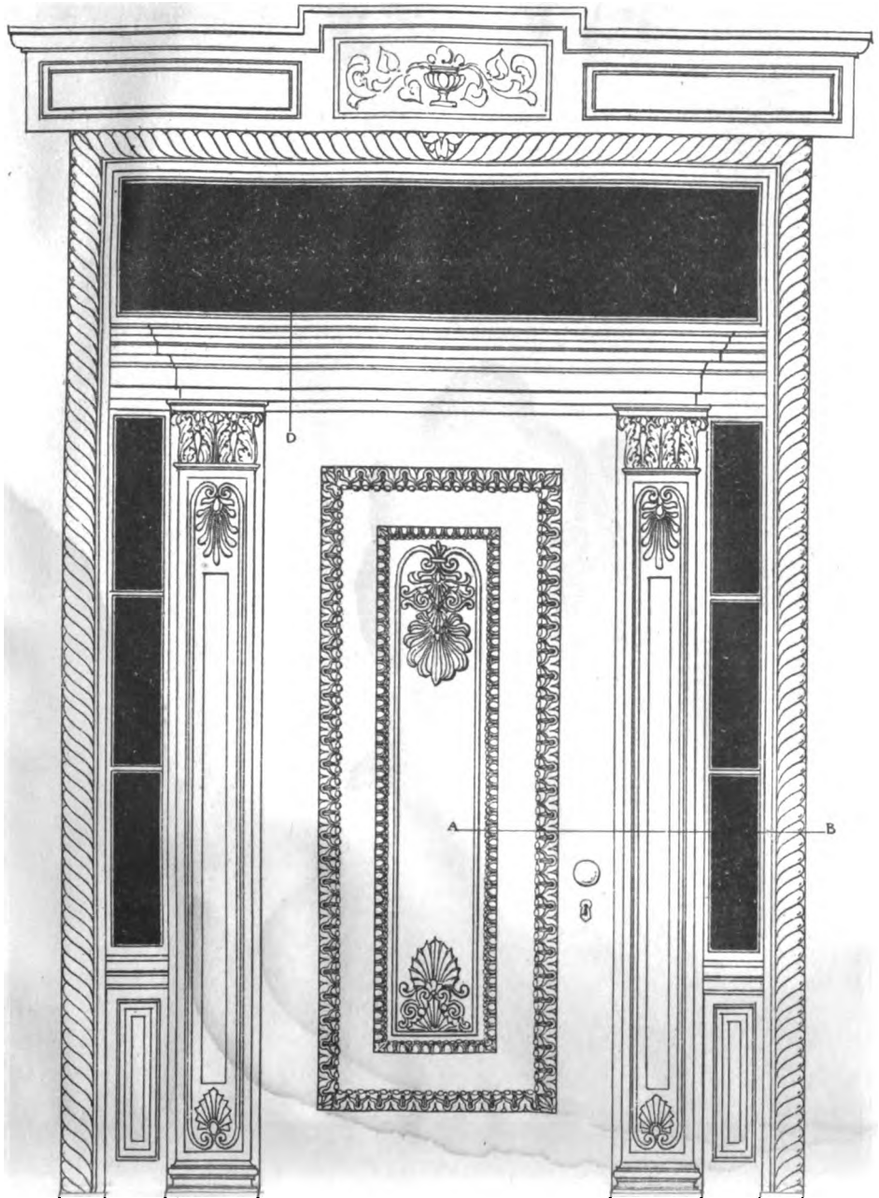
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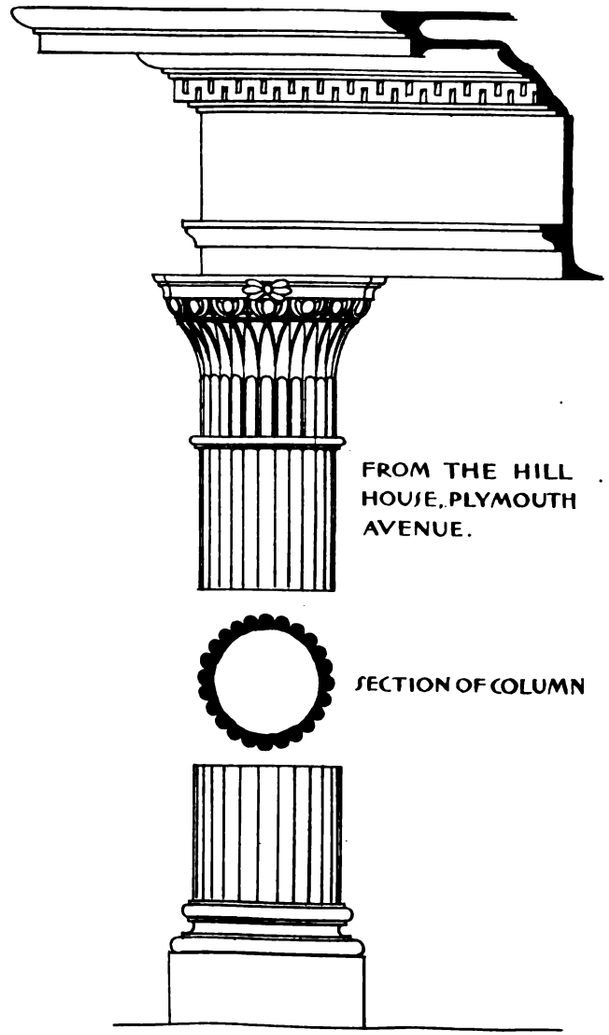
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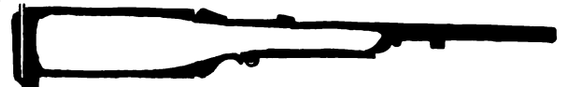
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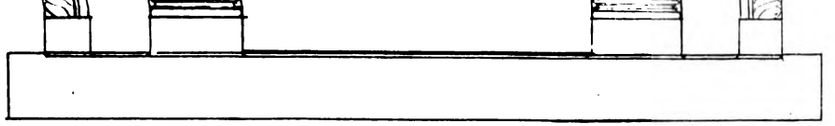


FROM THE HILL HOUSE, PLYMOUTH AVENUE.

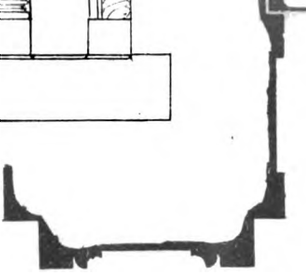
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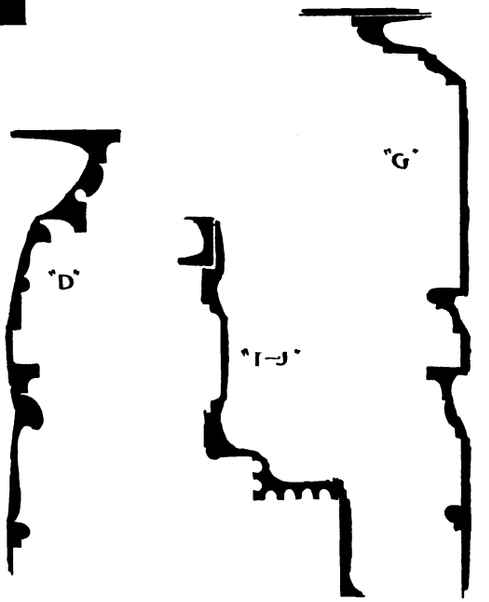


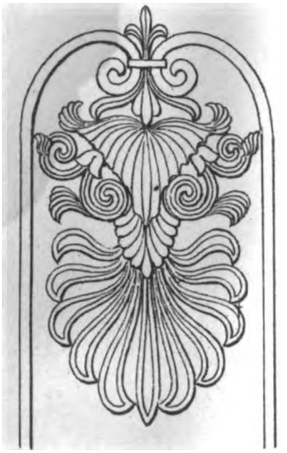
DOORWAY TO THE NEHEMIAH OSBORN HOUSE, EAST AVENUE



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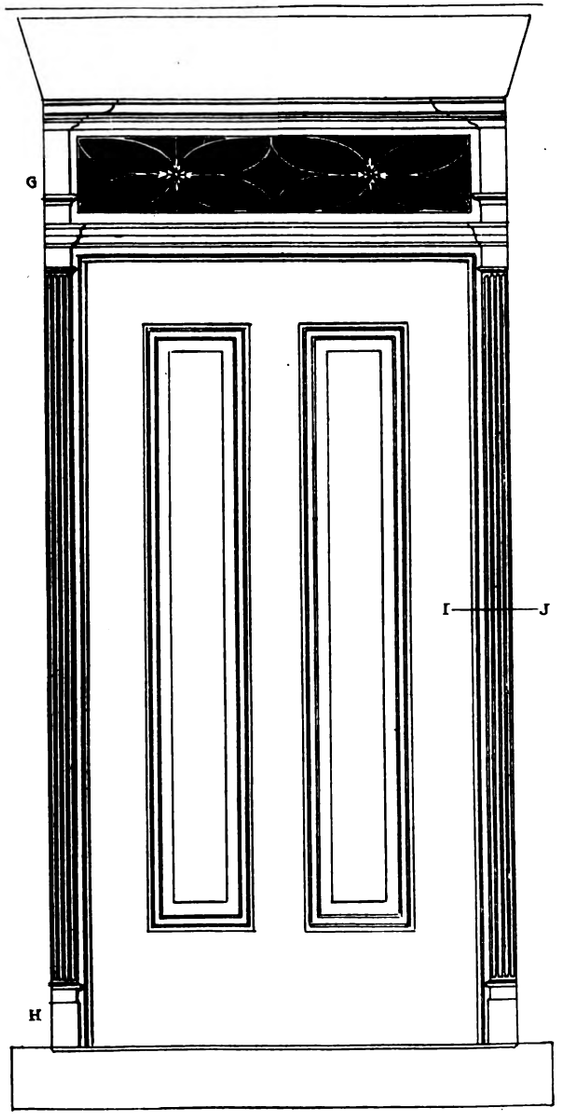


ORNAMENT ON DOOR

COLONIAL WORK IN THE GENESEE VALLEY

MEASURED AND DRAWN BY CLAUDE FAYETTE BRAGDON





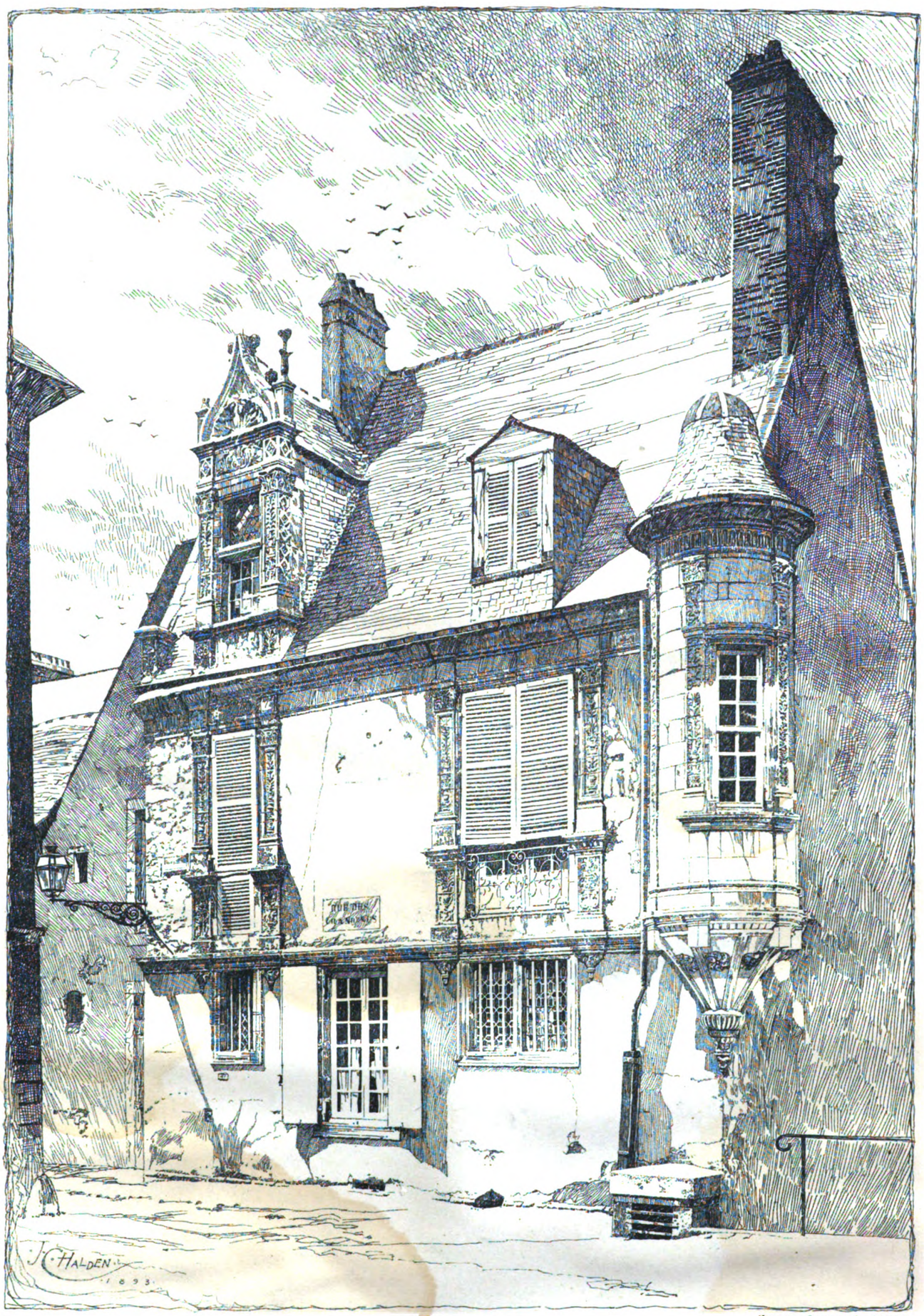
DOOR ON WEST AVENUE

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Old House Le Mans France

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SUGGESTION FOR A FOUNTAIN.

THEODORE BAUER, Sculptor.

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THE AMERICAN ARCHITECT AND BUILDING NEWS



VOL · XLIV

APRIL - JUNE

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Kennebunkport, Me. House of E. H. Curtis. W. L. Wilton, Architect, 960 (*Reg.*)
Leeds, Eng. School of Medicine. W. H. Thorpe, Architect, 954 (*Reg.*)
Liverpool, Eng. Details of Adelphi Bank. W. D. Caröe, Architect, 959, 961 (*Int.*)
Loches, France. Doorway, Church of St. Ours, 961 (*Int.*)

London, Eng.:—
Baths and Library, Westminster. F. J. Smith, Architect, 959 (*Int.*)
Choir Organ. St. Paul's, 963 (*Reg.*)
French Protestant Church. Aston Webb, Architect, 960 (*Int.*)
House in Bedford Park. R. Norman Shaw, Architect, 964 (*Int.*)
Imperial Institute. T. E. Collcutt, Architect, 954 (*Reg.*)
Lordship Lane Hall. H. G. Brace, Architect, 958 (*Int.*)
New Admiralty and War Offices. Leeming & Leeming, Architects, 954 (*Reg.*)
Northampton Institute. E. W. Mountford, Architect, 954 (*Reg.*)
Royal College of Music. Sir A. W. Blomfield, Architect, 963 (*Int.*)
346 Strand. H. O. Cresswell, Archt., 965 (*Int.*)
Long Ditton, Eng. House. J. Nixon Horsfield, Architect, 954 (*Int.*)
Lynchburg, Va. House of John Katz, Jr. E. G. Frye, Archt., 956 (*Reg.*)
Minneapolis, Minn. Apartment-house. Harry W. Jones, Archt., 960 (*Reg.*)
" " Venetia Apartments. Harry W. Jones, Architect, 965 (*Reg.*)
" " Wholesale Warehouse. Harry W. Jones, Archt., 957 (*Reg.*)
New Haven, Conn. First Presbyterian Church. F. R. Comstock, Architect, 964 (*Reg.*)
New Orleans, La. House on Camp St. James Freret, Architect, 959 (*Imp. and Int.*)

New York, N. Y.:—
American Tract Society Building. R. H. Robertson, Architect, 961 (*Reg.*)
City-hall. John McComb, Architect, 965 (*Imp.*)
Competitive Design for American Surety Building. George M. Huss, and John R. Thomas, Architects, 958 (*Reg.*)
" " " Ninth Regiment Armory. Smyth & McIlvaine, Archts., 960 (*Reg.*)
Entrance to Cable Building. McKim, Mead & White, Archts., 964 (*Imp.*)
" " Church Missions House. Gibson & Stent, Archts., 960 (*Imp.*)
Fireplace in House of H. G. Marquand, 955 (*Int.*)
House on West 76th St. Lamb & Rich, Architects, 966 (*Imp.*)
Lower Story, House of W. E. Roosevelt. W. H. Russell, Architect, 961 (*Imp.*)
Metropolitan Club-house. McKim, Mead & White, Architects, 958 (*Imp. and Int.*)
" Life Ins. Building. N. Le Brun & Sons, Architects, 954 (*Imp. and Int.*)
Tarrant Building. H. R. Marshall, Architect, 958 (*Reg.*)
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Peru, Ind. First Baptist Church. E. N. Lamm, Architect, 955 (*Reg.*)

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Proposed Country House of David Pepper. Wilson Eyre, Jr., Archt., 962 (*Reg.*)
Two Houses on Locust St. Wilson Eyre, Jr., Architect, 962 (*Reg.*)
Pittsfield, Mass. McKay Mausoleum. Mary E. Tillinghast, Architect, 962 (*Reg.*)
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" " John Fowler. Stewart, McClure & Mullgardt, Architects, 956 (*Reg.*)
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A DECISION was given a few weeks ago by the New York Court of Appeals, involving the point of the necessity of architects' certificates after the contract has been forfeited, and the owner has taken the work into his own hands to complete. A contract was made in the usual form, providing that no payment should be made except on the architect's certificate that the work was done to a certain stage, and containing also the ordinary provision, that under certain circumstances the owner might, after notice, take possession and finish the work, deducting the cost of doing so from the unpaid balance of the contract price. The owner took possession under this clause, and finished the work, at an expense less by some four thousand dollars than the unpaid balance of the contract price. The contractor demanded the four thousand dollars surplus, which the owner refused to pay, and suit was brought. The plaintiff, in his complaint, set forth the contract, and alleged that he had complied with it, and that the balance was due him. The owner denied the complaint, and set up counter-claims for delay. The case was opened by the testimony of the plaintiff, who proved the contract, and told what he had done under it, and said that he had applied to the architect for a certificate that the building was completed, but had been refused. On cross-examination, the defendant's counsel asked the plaintiff if the owner had not notified him of his intention to take possession and complete the work, and if he had not subsequently carried out his intention, and the plaintiff answered that he had. The counsel for the plaintiff, who seems to have waked up for the first time at this stage, asked the Court to have the question whether the architect had unreasonably withheld the certificate decided by the jury. The Court called his attention to the fact that there was no such issue in the case, as the complaint did not allege anything of the sort. The defendant then asked for a non-suit, on the ground that the contract, upon which the action was brought, and which was annexed to the complaint, made the procuring of the architect's certificate a condition precedent to the right to receive the final payment, and the complaint, which neither alleged that the certificate had been procured by the plaintiff, nor stated any facts excusing him from procuring it, disclosed no right of action. The Court agreed with this view, and ordered the complaint dismissed. The case was appealed to the General Term, which affirmed the judgment, and another appeal was taken to the Court of Appeals, which reversed it. The Court of Appeals did not regard the complaint as good, but it called attention to the fact that the defendant's counsel, in cross-examining the plaintiff, had brought out from him the fact, not stated in the pleadings, that the defendant had given notice of the forfeiture of the contract, and had taken the work into his own hands, and completed it. The Court of Appeals held that this was a new issue, opened by the counsel for the defendant, and that, as the owner, by finishing the work himself, would know when it was completed, without the architect's certificate to inform him, the evidence so brought out by the defendant's counsel tended to explain and excuse the absence of the certificate, and he was no longer entitled to have the complaint dismissed on the ground that no cause of action had been shown. The judgment of the General Term was therefore reversed, and a new trial granted. The *Engineering News*, which quotes this case at length, says, truly enough, that "the decision is interesting as indicating that, when the owner recognized the forfeiture of the contract, and undertook himself the completion of the work, the right to demand an architect's certificate was abandoned"; but this has been settled before, and the point of the decision, to our mind, lies in the hair's-breadth by which the plaintiff escaped the worst consequences of the carelessness or ignorance of his counsel. It is one of the admirable things about law — for the lawyers — that full counsel-fees are chargeable for all the four trials necessary to correct the consequence of making a complaint in an action of contract, without alleging the performance of the conditions of the contract, or giving any reasons for not performing them; and if the defendant's counsel had not incautiously and unintentionally given his opponent a helping hand, the poor contractor's case would have been hopeless.

THE *Engineering Record* gives interesting details of the tests, made by Mr. W. L. Stebbings, of Chicago, to determine the vibration of certain high buildings during the severe wind-storm which occurred in Chicago in February last. The first observation was made in the Monadnock Block. A plumb-line was let down in the well of the principal staircase, from the sixteenth story to the second, and a drawing-board, with a sheet of paper on it, was arranged so that the point of the plumb-bob hung one-sixteenth of an inch above the paper. After the preliminary untwisting of the line had ceased, the point of the plumb-bob was observed to describe a circle, about half an inch in diameter. A somewhat greater amplitude could have been obtained by letting the line descend to the first floor, but, when this was tried, the plumb-bob attracted so much attention among the people in the building that proper observations could not be made. A second test was made in the well of the south staircase, and here the plumb-bob was found to move in an elliptical path, the longer diameter of the ellipse being seven-sixteenths of an inch, and the shorter diameter three-eighths of an inch. Afterwards, as a verification of these measurements, Mr. Stebbings set up a transit, in a place perfectly sheltered from the wind, where he could observe the northwest and southwest corners of the same building. At the northwest corner, the extreme vibration, as observed by the telescope of the transit, was one-fourth of an inch, and at the southwest corner one-half an inch. During the progress of these observations, the wind was blowing at the rate of sixty to seventy miles per hour, and Mr. Stebbings tells the *Engineering Record* that at least a dozen wagons were blown over at the southeast corner of the building during the day. Architects will appreciate the strength and solidity of a building showing these results, and the second structure tested, the Pontiac Building, gave similar ones. Here the plumb-line was dropped from the fourteenth to the first floor, and the point of the plumb-bob was found to describe an ellipse, with a longer diameter of three-eighths of an inch, and a shorter diameter of one-fourth.

IN contrast with the extraordinary power of resistance to violent winds which some of the lofty buildings in Chicago have shown, it is interesting to note the destruction which has been wrought by similar winds in Germany. Last month a severe south-westerly storm occurred in Germany, which as the *Deutsche Bauzeitung* says, "caused everywhere serious injury to buildings." "Besides countless overturnings of house and factory chimneys," it continues, "the rolling off of the metal roofs of railway stations, and similar ravages, the fall of several church towers or spires is announced, in Altona, Neubrandenburg and Stettin." Among these catastrophes "the most serious mishap is the annihilation of the unfinished new dome of the Jacob-church at Stettin, which attained a height of one hundred and twenty metres" — about four hundred feet. This, in falling, brought down a large part of the roof of the church, but does not seem to have injured the vaulted ceilings. As German building work is popularly supposed to be heavy and solid, if nothing else, it is something of a satisfaction to see how well our steel "sky-scrapers" endure similar tests.

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GOVERNMENT BUILDINGS COMPARED WITH PRIVATE BUILDINGS.

By the term "Government buildings," I mean such structures as originate in the office of the Supervising Architect. By "Private buildings" I intend to designate all such as are designed by and in charge of architects who are engaged in private practice. It is not material whether they are erected for individuals, corporations, municipal authorities or the Government.

The United States post-offices, custom-houses, court-houses and marine-hospitals are designed in, and their construction superintended by the office of the Supervising Architect of the Treasury Department.

TABLE I.

SHOWING MAGNITUDE OF WORK DONE IN THE SUPERVISING ARCHITECT'S OFFICE.

Date.	Number in course of construction.	Site purchased.	Number completed.	Money expended.	Remarks.
				$	
1883	19	25	5		The apparent discrepances between the number for which sites are purchased and the number in process of construction, when added to the next year, is due to time occupied in making plans and other delays caused by the methods of the office.
1884	26	7	4		
1885	44	18	3	2,438,904.94	
1886	53	9	5		
1887	56	20	7		
1888	60	8	25		
1889	41	21	11	5,098,405.73	
1890	40	5	13	4,104,739.00	
1891	41	53	8	5,948,702.78	
1892	46	22	18	6,741,286.71	

The number of buildings erected and in charge of this office during a year is large; the amount expended on them increases approximately in proportion to the constantly increasing demands of the country.

The Table above (No. 1) shows this increase, as well as the number of buildings begun, in course of construction, and completed during each year between 1883 and 1893.

This Table is made from the yearly tabulated statements in the different Supervising Architects' Reports. The number under the head of "in process of erection" does not seem to mean exactly the same in different reports, as repairs in some cases are classed as buildings "in course of erection," in other cases these items are in a separate table. Mr. M. E. Bell, in his report for 1885, asserts that he had eighty buildings "in different stages of construction," and that the office had one hundred and fifty in its charge, and that the total cost of the new buildings would be $8,511,400 when finished. Mr. J. H. Windrim, in 1890, had one hundred under construction, alteration or repair, and the office had charge of two hundred and fifty buildings. He states that the output of the office had increased twenty per cent in fifteen years. Naturally we may expect this increase to continue in an equal ratio with the growth of the country.

Government buildings are scattered from one end of the country to another, from towns of 1,674 population, like Abington, Va., which has a building that cost $73,000, to Raleigh, N. C., with 12,600 population, and a building that cost $341,500; from a city like Memphis of 64,495 population and a building costing $520,500, to Washington City with 250,000 population and a $2,000,000 building; and

TABLE II.

ALL FIRST-CLASS STRUCTURES. FIREPROOF THROUGHOUT.

BUILDINGS COMPARED.			CHARACTER OF CONSTRUCTION.			COST.		TIME OF CONSTRUCTION AND COMPLETION.		
By whom erected.	Location.	Name.	Walls.	Floors.	Roofs.	Per cu. ft.	Total.	Commenced.	Completed.	Actual time.
						cts.				
Private.	Boston.....	Chamber of Commerce.	Worcester granite, Kibbie sandstone and brick.....	Iron, terra-cotta, concrete covered with wood.	Iron and terra-cotta....	29	$411,591	May 1890	Mar. 1892	1 yr. 8 mos.
"	"	Ames Building.....	Worcester granite, Amherst sandstone and brick.	Iron, terra-cotta, concrete covered with wood.	Iron and terra-cotta....	53	$656,656	July 1889	July 1891	2 yrs.
"	"	Exchange Building.. .	Branford granite and brick.....	Iron, terra-cotta, brick backing..	Iron and terra-cotta....	40	$1,780,384	Jan. 1889	May 1891	2 yrs. 5 mos.
Gov't...	New York.....	Barge Office.....	Granite, brick backing.....	Iron, terra-cotta, brick backing..	Iron, slate and copper.	60.9	$203,334	Jan. 1879	May 1883	4 yrs.
"	Hartford, Conn.	Custom-house and Post-office.....	Granite facing, brick backing...	Iron beams, brick arching.....	Iron, slate and copper.	102.8	$811,204	Jan. 1872	May 1883	11 yrs.
"	Albany.....	Custom-house and Post-office.....	Granite, brick backing.....	Iron beams and brick arching ..	Iron, slate and copper.	46.2	$610,743	Jan. 1874	May 1885	11 yrs.
"	Boston	Post-office and Sub-treasury.....	Granite facing, brick backing...	Iron beams, brick arching...	Iron, slate and copper.		$4,617,537	July 1870	July 1884	14 yrs.
"	Brooklyn.....	Post-office.....	Granite facing, brick backing...	Iron beams, brick arching.....	Iron, slate and copper.	42	$3,565,726		1892	7 yrs.
Private.	Kansas City....	New York Life Insurance Bldg.....	Granite, Kibbie sandstone and brick.....	Iron and terra-cotta.....	Iron, terra-cotta.....	38	$950,265	July 1885	July 1887	2 yrs.
Gov't...	" "	Custom-house and Post-office.....	Sandstone and brick backing...	Iron beams, brick arching.....	Iron, slate and copper.	48.8	$354,292	Apr. 1879	1887	8 yrs.
"	Little Rock, Ark.....	Custom-house and Post-office.....	Sandstone and brick backing...	Iron beams, brick arching.....	Iron, slate and copper.	46.6	$215,788	1873	1882	9 yrs.
Private.	Cincinnati.....	Chamber of Commerce.	Granite facing and brick backing...	Iron and terra-cotta.....	Iron, terra-cotta and tiles	30	$750,000	Dec. 1886	Feb. 1889	2 yrs. 2 mos.
Gov't...	"	Post-office and Custom-house	Granite, brick backing.....	Iron beams and brick arches ..	Iron, slate and copper.	65.1	$5,088,382	1872	1887	15 yrs.
"	Memphis	Post-office and Custom-house	Granite, brick backing.....	Iron beams, brick arches	Iron, copper and slate..	66.6	$510,967	1876	1886	10 yrs.
Private.	Chicago	Auditorium.....	Stone facing, brick backing.....	Iron beams, terra-cotta.....	Iron beams, terra-cotta arches. ...	38	$3,500,000	1887	1890	3 yrs.
Gov't...	"	Custom-house.....	Sandstone and brick backing...	Iron beams, brick arches	Iron, wood, slate and copper	67.8	$4,323,912	1871	1881	10 yrs.
"	St. Louis.....	Custom-house.....	Granite and brick backing.....	Iron beams, brick arching	Iron, slate and copper.	96	$5,395,299	1874	1884	10 yrs.
Private.	Pittsburgh.. ...	Allegheny County Court-house.....	Granite facing, brick backing...	Iron and terra-cotta.....	Iron, terra-cotta and slate.....	31	$2,450,000	Sept. 1884	Apr. 1888	3 yrs. 7 mos.
Gov't...	Harrisburg.....	Post-office and Court-house	Granite, brick backing.....	Iron beams and brick arches...	Iron, slate and copper.	60.5	$264,361	1877	1883	6 yrs.
"	Pittsburgh.....	Post-office and Court-house.....	Granite, brick backing.....	Iron beams and brick arches...	Iron, slate and copper.	49	$1,610,462	1882	1893	11 yrs.
"	Cleveland	Post-office and Court-house	Sandstone, brick backing....	Iron beams, brick arches.....	Iron and slate.....	50.6	$300,000	1880	1885	5 yrs.
Private.	Omaha, Neb....	New York Life Insurance Building.....	Granite, sandstone and brick.....	Iron and terra-cotta.....	Iron and terra-cotta....	39	$833,399	July 1885	July 1887	2 yrs.
Gov't...	Topeka, Kan....	Custom-house and Post-office.....	Limestone, brick backing.....	Iron beams and brick backing..	Iron, terra-cotta, slate and copper.	40.5	$280,314	1875	1885	10 yrs.
"	Philadelphia...	Post-office.....	Granite, brick backing.....	Iron beams, brick arching	Iron, slate and copper.	61.5	$4,314,842	1873	1885	12 yrs.
"	Trenton, N. J..	Custom-house and Post-office.....	Granite, brick backing.....	Iron, bricks and brick backing..	Iron, slate and copper.	51.7	$321,075	1872	1877	5 yrs.

Note.—In the Table, commencement is taken at date of purchase of site, and total cost where taken from Mr. Blackwell's tables is exclusive of heating, vaults, site and approaches.

With the exception of a few buildings in Washington, Annapolis and West Point, and some hospitals and cemetery-lodges in different parts of the country, this office acts as architect for all the Government buildings in the United States.

New York with $8,906,370 in one building, and $4,771,000 in quite a number of smaller ones.

Structures built for the United States, no one will deny, should be the best of their kind obtainable for the money invested in them.

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Most persons will agree that they should be the best for their purpose, irrespective of cost. All desire them to be at least equal in design and construction to the best obtained in private practice.

For years, cultured people and those of artistic instincts, as well as the architects of the country, have protested against the character of design shown in official buildings, and business men and architects have questioned the unnecessary cost and great length of time required to build such structures under the rules in vogue in the office of the Supervising Architect.

The majority of the constituents of Congressmen, knowing little about such things, have rested content, and hence Congress for years took no action in the matter. In the last few years the Committee on Public Buildings and Grounds have shown an appreciation of the above facts. Architects think the remedy can be found in a limited competition, with a decision on the merits of the plans by an expert jury. Mr. W. A. Potter in his report as Supervising Architect, as early as 1875, recommended that the plans for public buildings throughout the country be obtained by public competition. Messrs. J. G. Hill, M. E. Bell and J. H. Windrim, while occupying the position of Supervising Architect, advised similar legislation, because they believed it would be a benefit to the country. Mr. Windrim urged the matter forcibly in his reports of 1889 and 1890.

The first positive action was the bill presented to the House by Representative Stockslager on December 4, 1884, which proposed a complete remodelling of the Supervising Architect's office and described minutely the methods of conducting the competitions and of making the awards. The American Institute of Architects took active measures in advocacy of this bill, Messrs. Bloor, Adler and Burnham coming to Washington for that purpose. The bill and its advocates received little consideration from the Committee and it never was presented to the House. At the Convention of the American Institute of Architects held in Boston, 1891, Mr. J. H. Windrim, at that time ex-Supervising Architect, read a paper on the subject and as a consequence, in part, the Directors of the Institute went actively to work on the matter. A committee was appointed, with Mr. Windrim as chairman, and the bill drawn up by them was presented to Congress by Mr. John C. Tarsney of Missouri. This bill, slightly modified, passed the House July 1, 1892.

TABLE III.

SECOND-CLASS FIREPROOF BUILDINGS, IN WHICH A PORTION OF THE INTERIOR IS FIREPROOF, OR OF WHICH THE EXTERIOR IS PRINCIPALLY LAID IN PLAIN BRICKWORK WITH PLAIN STONE OR TERRA-COTTA TRIMMINGS.

BUILDINGS COMPARED.			CHARACTER OF CONSTRUCTION.			COST.		TIME OF CONSTRUCTION AND COMPLETION.		
By whom erected.	Location.	Name.	Walls.	Floors.	Roof.	Per cu. ft.	Total.	Commenced.	Completed.	Actual time.
						cts.				
Private.	Kansas City, Mo.	Kansas City Exchange.	Brick and carved terra-cotta.	Iron beams and terra-cotta	Tiles, terra-cotta, gravel.	29.4	$650,000	Nov. 1886	May 1889	2 yrs. 6 mos.
Gov't.	Lincoln, Neb.	Custom-house and Post-office.	Sandstone, brick backing.	Iron beams, brick arches	Wood, slate and copper.	42.8	$185,000	Apr. 1873	1880	7 yrs.
"	Parkersburg, W. Va.	Custom-house and Post-office.	Pressed-brick, limestone trimmings.	Iron beams, brick arches	Wood, slate and copper.	39.9	$227,595	June 1873	1878	5 yrs.
"	Austin, Texas.	Custom-house and Post-office.	Sandstone, brick backing.	Iron beams, brick arches	Iron, wood, slate and copper.	42.9	$175,665	Aug. 1877	1882	5 yrs.
Private.	St. Louis, Mo.	Wainwright Building.	Iron frame, brick filling.	Iron frames, tile arches	Iron beams, tile arches.	25	$550,000	1890	1893	3 yrs.
Gov't.	Evansville, Ind.	Custom-house and Post-office.	Sandstone, brick backing.	Iron frame, brick arches	Wood, slate and copper.	38.6	$226,792	Feb. 1874	1881	7 yrs.
"	Paducah, Ky.	Custom-house and Post-office.	Limestone facing, brick backing.	Iron beams, brick arches	Wood, slate and copper.	46.5	$131,419	July 1880	1885	5 yrs.
Private.	Chicago, Ill.	Hammond Library.	Masonry walls.	Iron beams, terra-cotta arches	Iron and terra-cotta.	19	$183,600	1882	1883	1 yr.
Gov't.	"	Appraisers' Stores.	Brick, trimmed with stone.	Iron beams, brick and terra-cotta.	Iron, terra-cotta covered with asphalt.	48	$693,210	1889	1892	3 yrs.
"	Frankfort, Ky.	Custom-house and Post-office.	Limestone, brick backing.	One floor iron beams, other wood joist.	Wood and slate.	32.4	$103,319	Dec. 1882	1887	5 yrs.
"	Grand Rapids, Mich.	Custom-house and Post-office.	Brick, stone trimmings.	Two floors iron, attic wood.	Wood and slate.	26.8	$133,265	Aug. 1874	1881	7 yrs.
Private.	Washington, D. C.	National Union Building.	Narrow stone, stone front, brick sides.	Iron, terra-cotta arches	Iron and slate.	24.5	$100,000	1889	1890	1 yr.
"	Washington, D. C.	Soldiers' Home.	Marble, brick backing	First floor iron beams, brick arches, other floors, slow-burning	Roof, slow-burning.	26	$175,000	1886	1888	1 yr. 6 mos.
"	Richmond, Va.	State Library	Brick, terra-cotta, stone	Iron beams, brick arches	Iron, terra-cotta, slate.	23	$190,000	1892	1894	2 yrs.

TABLE IV.

ALL THIRD-CLASS STRUCTURES. PLAIN BRICKWORK WITH WOODEN JOISTS AND ROOFS.

BUILDINGS COMPARED.			CHARACTER OF CONSTRUCTION.			COST.		TIME OF CONSTRUCTION AND COMPLETION.		
By whom erected.	Location.	Name.	Walls.	Floors.	Roof.	Per cu. ft.	Total.	Commenced.	Completed.	Actual time.
						cts.				
Gov't.	Poughkeepsie, N. Y.	Post-office.	Pressed-brick, stone and terra-cotta trimmings.	Wood joists and flooring.	Wood framing covered with slate.	25.4	$67,276 00	1883	1887	4 yrs.
"	Montgomery, Ala	"	Pressed-brick, stone and terra-cotta trimmings.	Wood joists and flooring.	Wood framing covered with slate.	31.1	$149,848.00	1880	1885	5 yrs.
"	Jackson, Tenn.	"	Pressed-brick, stone and terra-cotta trimmings.	Wood joists and flooring.	Wood framing covered with slate.	28.2	$56,996.00	1883	1887	4 yrs.
"	Jackson, Miss.	"	Pressed-brick, stone and terra-cotta trimmings.	Wood joists and flooring.	Wood framing covered with slate.	36.9	$110,492.08	1882	1887	5 yrs.
"	Abington, Va.	"	Pressed-brick, stone and terra-cotta trimmings.	Wood framing and flooring.	Wood framing covered with slate.	27.5	$73,600.47	1887	1891	4 yrs.
Private.	Winston, N. C.	National Bank Building.	Pressed-brick, stone and terra-cotta trimmings.	Wood framing and flooring.	Wood framing covered with slate.	10	$40,000.00	1891	1892	1 yr.
"	Washington, D. C.	*Evening News* Building.	Pressed-brick, stone and terra-cotta trimmings.	Wood framing and flooring.	Wood framing covered with slate.	12½	$90,000.00	1884	1884	6 mos.

Note.—The total cost of buildings for the Government differs slightly in some cases as recorded, because of repairs, approaches and heating being added or omitted; but as I only use the total cost in these Tables to indicate the magnitude of the work it is not a material point. The cost per cubic foot is not necessarily computed from the totals I give, as all the costs per cubic foot come directly from the Supervising Architect's office.

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On January 10, 1893, the Board of Directors of the American Institute of Architects met in Washington. They had two conferences with the Committee of Public Buildings and Grounds of the United States Senate. The House bill, without essential change, was passed by the Senate in March, 1893, and signed by President Harrison just before his term of office expired. Thus the bill became a law. The American Institute of Architects deserves the united moral and material support of the whole profession for its efforts to carry this measure through, and they further need and deserve such support in their continued effort to get the bill put into operation, or so modified as to make it mandatory.

Mr. E. H. Kendall, at that time the President of the American Institute of Architects, was most energetic in this work and is entitled to the thanks of architects for his active, intelligent, and at the same time conservative, management of the affair, and Mr. R. M. Hunt, one of the best known of the Institute's ex-Presidents, increased at that time the obligation which the profession owes to him: although at this period one of the busiest architects of the country, he gave ungrudgingly of his time, and aided the cause by the earnestness and enthusiasm with which, as always, he supported public measures that tend towards the advancement of either good architecture or the welfare of the profession.

There was no mandatory clause in this bill: such a clause was omitted because the Committee thought the measure would have a better chance of passing without it, there being little fear that the Secretary of the Treasury would antagonize the measure if the operation of the bill were left at his discretion.

Early in the administration of the Secretary of the Treasury, J. G. Carlisle, a meeting of the Directors of the American Institute of Architects was held in Washington (March 22, 1893), headed by the President, Mr. E. H. Kendall. By appointment, the Committee called on the Secretary, who listened attentively and appreciatively to the case as presented by the Officers and prominent Directors of the Institute from New York. By the request of the Secretary of the Treasury, the Executive Committee of the Institute sent him a written digest of the case as presented at the meeting for future reference. The receipt of this letter or paper was duly acknowledged. At this time



Original Design for United States Court-house and Post-office, Detroit, Mich.: Supervising Architect's Office, 1883.

the Secretary was evidently favorably impressed. The final correspondence between Mr. Burnham and the Secretary unfortunately became quite acrimonious.[1]

Twelve months have passed and we now hear through interviews from the office of the Supervising Architect, that the law has been practically abandoned as far as this administration is concerned.

The question may well be asked. Why is this the case?

First, Mr. Edbrooke, the Supervising Architect during the last administration, squarely opposed the measure, and the present incumbent, Mr. O'Rourke, is apparently practically of the same opinion. Both have stated, one in a letter or interview before Congress, and the latter in a paper read in Chicago before the World's Congress of Architects, in effect "that Government buildings are fully equal to municipal and private work of like magnitude in artistic effect, time of erection and cost of construction." In this paper I propose to make a comparison of a small number of Private and Government buildings, which I hope will answer some of the doubts raised by this difference of opinion.

In making this comparison, as nearly as possible I propose to take buildings located in the same sections of the country, and constructed in the same manner and of similar material. The comparison will be made on the following basis: Cost of building, time of completion, cost of architect's services, business methods and, last and most important, character of design.

The accompanying Tables will give the principal facts so they can be understood at a glance, while the illustrations which accompany this article will show the artistic and architectural effects so they too can be easily appreciated.

These Tables are compiled from data given either by the architects or the contractors of the structure mentioned in the case of the private buildings. For Government buildings the matter is taken



Second Design for United States Court-house and Post-office, Detroit, Mich.: Supervising Architect's Office, 1887.

from various Government Reports and a table by J. E. Blackwell, made while he was Computor in the Office of the Supervising Architect, which furnished data for their cost per cubic foot. It is difficult to determine the exact time of either the beginning or completion of these buildings from the information contained in these reports, but I have taken as time of beginning the date when money was appropriated to begin the structure; and for time of completion the year when the reports mention the building as complete. In many cases work seems to have gone on for years after they were called complete, the work on them in these cases being classed under the head of alterations or repairs, in some cases the cost of such repairs running up from $200,000 to $400,000. The time designated rather under-estimates than over-estimates the actual time.

AVERAGE COST.

The average cost of first-class fireproof private buildings as deduced from Table I is 37 cents per cubic foot, and for first-class Government buildings the average is 59.6 cents per cubic foot, or 62 per cent more than private work.

For second-class Government buildings we have cost per cubic foot of 39.6 cents; for private buildings of similar class 24.5 cents per cubic foot, or 61.9 per cent more than private work.

For brick structures with stone trimmings, wooden joists and roofs without fireproof qualities, Government buildings average 29½ cents per cubic foot, while private buildings of same character cost only about 18 cents per cubic foot, that is Government work costs 67 per cent more than private work.



Third Design for United States Court-house and Post-office, Detroit, Mich.: Supervising Architect's Office, 1888.

Taking each class, it will be seen that there is a difference in favor of private buildings of over 60 per cent.

TIME OF COMPLETION.

The average time of completion of large private structures is 29 months. Of Government buildings it is 96 months; this is allowing

[1] More detailed accounts of these occurrences may be found in the *American Architect*. Stockslager's Bill, *American Architect*, December 20, 1884. Meeting before House Committee, April 2, 1892. Meeting before Senate Committee, January 2, 1893. Interview with Secretary, August 5, 1893. Letters between the American Institute of Architects and Treasury Department, March 31, 1894.

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about two years after first appropriation for the acquiring of titles to the building site. For an actual comparison let us take the Allegheny County Court-house, 43 months under construction, the Auditorium, 36 months, St. Louis and Chicago Government buildings, 10 years; Pittsburgh Post-office, 11 years; Boston Post-office, 14 years.



Original Design for United States Custom-house and Post-office, Chicago, Ill.: Supervising Architect's Office, 187–.

The time of completion has an average in favor of private buildings of from 300 to 500 per cent. A curious instance of long delays may be mentioned in connection with the Detroit Post-office. The first money was appropriated for the Detroit site in 1882. From that



Auditorium Building, Chicago, Ill.: Private Architect Cost per cubic foot, 38 cents; Time of Construction, 36 months.

time on, to March 2, 1889, $1,374,635 was appropriated and in the hands of the Supervising Architect. On September 30, 1892, three years and seven months after, he had more than a million dollars in hand, while only $222,400 had been spent on the building, and only the masonry of the principal story was complete. No claim could be made in this case for lack of appropriation in bulk to prosecute the work.

At Washington, on August 30, 1890, $250,000 was appropriated, exclusive of cost of lot, to commence building. August 2, 1892, $250,000 more was appropriated, yet in December, 1893, only the excavation piling and part of cellar walls had been completed. These are not isolated cases, for the same may be said of Troy, N. Y., Scranton, Pa., Milwaukee, Newark, Pittsburgh, St. Paul and so on, almost indefinitely.

Instead of lack of appropriation to carry on the work rapidly, there seem to have been inherent defects in the business methods of the office, and a failure to utilize or use up the money in hand in



United States Custom-house and Post-office, Chicago, Ill.: Supervising Architect's Office, 1887. Cost per cubic foot, 67.8 cents. Time of Construction, 120 months.

so many instances, that Congress has had quite a plausible excuse for giving small appropriations yearly.

COST OF ARCHITECTURAL SERVICE.

The usual fees of an architect are five per cent on the cost of a building. This includes: the preparation of scale-drawings and specifications, two and one-half per cent; details, one per cent, and supervision, one and one-half per cent. To be added to this is the *per diem* of a superintendent, from $4.00 to $10.00 per day, according to the capacity required of him, who remains in charge of the building during its construction.

Mr. Bell, in his Report (1886), gives as an average of cost two and nine-tenths per cent, comparing it with architects' fees of two and one-half per cent and designating it as the cost to the Government of plans made in his department on an expenditure between 1875 and 1885 of $41,489,303. Mr. Freret from buildings selected at random makes an average (two and two-tenths) for what he calls draughtsmen's services (excluding tracers, photo-duplication, and other things that an architect would pay for); whether these services correspond exactly with those an architect performs in making scale-drawings and specifications, I do not know, but evidently the intention in having the calculation made was to establish such a comparison, and Mr. Bell so states in his report. Yet I understand that on some buildings the preparation of scale-drawings, specifications and details have been five per cent, that is, double the usual charge of a private architect.

For supervision the Government employs a superintendent, paying him from $6.00 to $9.00 a day, and gives him from one to four assistants, paying them from $3.00 to $5.00 per day on each building, besides the services incidentally of a travelling superintendent and the Supervising Architect. Besides this, special men for testing iron and other material are sent out occasionally from Washington.

The number employed on two buildings of different classes will give a fair idea as to the cost of superintendence, when it is remembered how long such buildings are in course of erection.

Louisville.— Superintendent, $8.00 per day.
Clerk, $4.00 per day.
Foreman, $5.00 per day.
Two watchmen, $2.00 each per day.
Disbursing Agent, three-eighths of one per cent.



United States Government Building for the World's Fair, Chicago, Ill.: Supervising Architect's Office, 1892.

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The Superintendent is paid his *per diem* for Sundays and holidays.

El Paso. — Superintendent, $6.00 per day.
Clerk, $4.00 per day.
Disbursing Agent, three-eighths of one per cent.



United States Court-house and Post-office, Macon, Ga.: Supervising Architect's Office, 1886.

Table V shows a comparison between the cost of architectural service on a Government building and what the same services of an architect in private would have amounted to.

TABLE V.

TABLE SHOWING COST OF ARCHITECTURAL SERVICE.

Location.	Total cost of Building.	Fee of Disbursing Agent.	Cost of drawings. U. S.	Cost of office-work and supervision. Private office.	Gov't. Superintendence. .23 per day.	Private Superintendence.	Total Gov't.	Total Private.
	$	$	$	$	$	$	$	$
Pittsburgh P. O.	1,598,430	5,994	46,354	.....	69,000	.....	121,638	.....
	.....	.....	.....	79,925	.....	12,000	.....	91,925
Cleveland P. O.	331,000	1,242	9,599	.....	24,000	.....	34,840	.....
	.....	.....	.....	16,550	.....	6,000	.....	22,550
Kans. City P. O.	370,027	1,386	10,730	.....	24,000	.....	36,116	.....
	.....	.....	.....	18,501	.....	6,000	.....	24,501



United States Post-office, Canton, O.: Supervising Architect's Office, 1891.

The Table does not take into consideration the cost of travelling and special inspectors, which would probably be about the same in either case.

The average cost of architectural service as deduced from the above Table would be about nine per cent (.911) while if the service had been rendered by a private architect it would have been about six per cent (.593), in each case including the cost of local superintendents.

The labor roll (according to the Blue Book) under the Supervising Architect in 1891 was $386,500: add to this the cost of the material



United States Post-office, York, Pa.: Supervising Architect's Office, 1892.

used and we would have $400,000 as a closely approximate estimate of the cost of the office.

Total cost of Supervising Architect's office.		$5,948,702
Deduct the cost of office, less about $20,000, for which a special appropriation was made,	$380,000	
Deduct amount expended for sites	948,453	1,328,453
Cost of buildings.		$4,620,249
Under private architect, including superintendence. . .		6
		$277,204

Against over $400,000 which this service cost the Government.

It will also be seen from the above figures that the office cost the Government more than nine per cent of the cost of the buildings.



United States Court-house and Post-office, Cleveland, O.: Supervising Architect's Office, 1880. Total cost, $331,000; Cost per cubic foot, 50.6 cents; Time of Construction, 60 months.

BUSINESS METHODS.

The organization, method of making appointments and appropriations, and the constant changes in the heads of the Departments, all combine to form a cumbersome and uneconomical method of doing business.

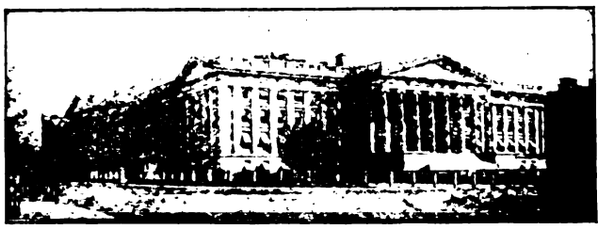


Cincinnati Chamber of Commerce, Cincinnati, O.: Private Architect.

First, for the head of the office an architect who is in active and successful practice, and whose ability is known and appreciated on large work, cannot afford to accept the position. A large number of

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the appointments are due to political friendships or service, when they should be made only because of the applicant's capacity. The political side is particularly shown in the appointment of local superintendents. I have known of men who had never been architects, draughtsmen, engineers, carpenters, masons, or in any way connected with buildings, made "superintendents of construction" on a two-million-dollar piece of work. [As adviser to such "superintendents" the Government employs an assistant who *is* a builder.] Of



United States Treasury Building, Washington, D. C.: Private Architect.

course no architect in private practice would tolerate superintendents of this character.

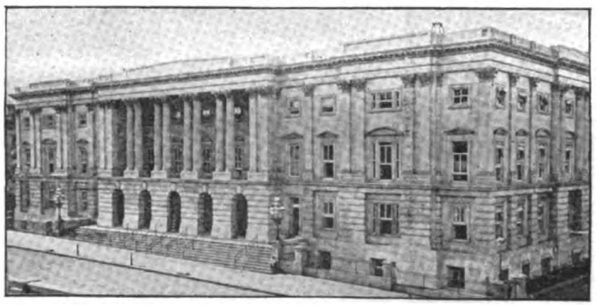
When the office is crowded, the preparation of plans is delayed: it does not seem practicable to increase the force temporarily and get through with the work expeditiously as would be done in a private architect's office. As a matter of fact the office is, or was recently, nearly a year behind with its work.[1]

The frequent changes in the administration of the office causes delay (1) by the time necessary for the new chief to familiarize himself with the official routine and (2) by the new incumbent's remodelling buildings and plans; frequently new plans, not always conducive to improved arrangement or design, are made. Such changes are always the cause of considerable delay and increase in the cost of construction and architect's service, the new architect wishing naturally to put his impress on the work. All the large buildings have been changed in this way as they progressed. Some have been completely redrawn several times, and in other instances large portions, if not whole stories, have been pulled down to please the fancy of a new incumbent.

It is to the interest of local superintendents and their assistants to have work last as long as possible, working as they do on a *per diem*, and their work ceasing with the completion of the building. All the interest of a private architect tends in the other direction. As the head superintendent, he would push the work to completion as expeditiously as possible; his fee being a percentage, the sooner his work was completed the more he would earn.

The division of labor in the Supervising Architect's office does not tend to produce the best outcome. The head of the office has his time occupied principally in routine work, signing documents, interviewing and being interviewed by the Secretary and members of Congress and their constituents. The designing and construction of Government buildings is practically done by subordinates because the Supervising Architect himself has no time to give to these, the most important duties pertaining to his office.

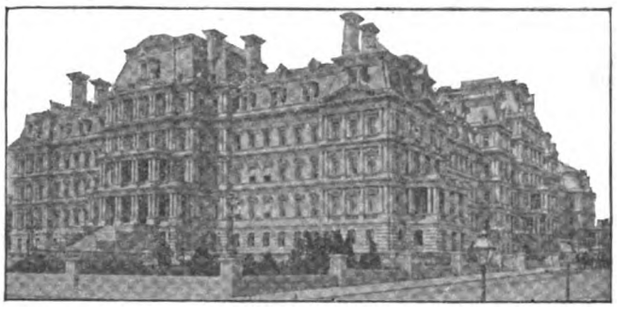
The designer does not have precedence of the chief constructor but, *vice versa*, the constructor is in charge of the draughting-room where the designing is done, while the Chief Clerk, the Acting Supervising Architect in the absence of that officer, has been for years neither an architect nor an engineer, but an accountant or a lawyer. The divisions work independently of each other, and the Supervising Architect has no time to supervise them. Finally, the local superintendent is in no way interested in carrying out the design or construction; he is to all practical purposes responsible only



Old United States Post-office, Washington, D. C.: Private Architect.

to his Congressman and interested only in having the work last as long as possible. The men who actually design the building and devise the construction have no direct control or influence over the man who is supposed to be carrying out their ideas.

How different is this case from that of the private architect who designs the building, devising, working into and harmonizing with the design the principal constructive and utilitarian features, and at the same time acting personally as the principal superintendent. The designer in the latter case acts as the chief constructor and supervisor. His interests being equal in all branches, all being



State, War and Navy Department Building, Washington, D. C.: Government Architect

directly under his charge; the proper working-out of each branch being positively necessary to the most economical and perfect development of the building. Only by direct charge of this kind can the most perfect outcome be obtained, even from men of ability. The appropriations which are made from year to year, in comparatively small sums — to which cause the Supervising Architects charge the length of time required to complete Government buildings — is probably due to the action of the office in failing to use up from year to year appropriations which it has at its disposal. Take for instance the case of the Detroit Post-office, $1,300,000 being in the hands of the Supervising Architect nearly four years — with several years' warning that it was coming — and only a little over $200,000 used at the end of that time. With a private architect the building would have been completed. This is only one of many cases, several of which have been previously mentioned. It appears that the blame for small appropriations must rest largely with the office.

There has been quite a tendency to duplicate drawings, using those which have been prepared for one location for buildings which are situated in some other section of the country. This is unfortunate alike for good design, construction and comfort, as all these points are and should be more or less influenced by the character of the site. One of the Committee on Public Buildings and Grounds told of a building where an excavation was made twenty feet into solid rock only to be filled up with rubble masonry, because the plan of a building was used which was originally prepared for a foundation on "made ground."

One of the Supervising Architects introduced the system of "stock" design for details, very suggestive of stock galvanized-iron ornaments. Although the Supervising Architect has a notice of a year or more in each case which it could give to the preparation and careful consideration of the design for his buildings, still under the system of doing work the design is usually left until the last moment, and this, the most important part for the general public, is finished in a few days,



United States Post-office, Washington, D. C.: Supervising Architect's Office, 1891.

very much to the detriment of the building and its effect as an educative example for the people.

THE DESIGN.

I think the clearest way to explain this portion of the discussion is to simply show illustrations of some of the buildings described in the foregoing Tables and give a short analysis of their principal features and most prominent characteristics.

The Allegheny Court-house, Pittsburgh, and the United States

[1] From a statement in the Carlisle-Burnham correspondence, I understand that Mr. O'Rourke says the office cannot do the work on hand in three years.

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Post-office are in the same city. The first mentioned is built of granite, is simple, dignified, and at the same time massive, conveying immediately the idea of a Municipal building. The ornamentation in the way of carving is the very best of its kind in design and execution, and the whole is considered by the profession as one of the architectural monuments of the country.

The Pittsburgh Post-office, although one of the best of the modern post-offices, still is lacking in that massiveness, simplicity and harmonious proportion so conspicuous in its neighbor; in fact, it is com-



United States Court-house and Post-office, Pittsburgh, Pa.: Supervising Architect's Office, 1880. Total cost, $1,598,430; Cost per cubic foot, 49 cents; Time of Construction, 216 months.

monplace, its ornamentation poorly designed, ragged and fussy. The wings and the central mass do not appear as a harmonious whole.

Cincinnati Chamber of Commerce. In the Cincinnati Exchange we have a bold, effective design, one that will always arrest attention and at the same time receive commendation for large, well-proportioned masses, the oneness in the grouping of its different parts and the strength apparent in its corners. The fenestration is remarkable in its effectiveness. The carving is unique and artistic in design, and excellent in execution.

The Cincinnati Post-office is one of those commonplace, so-called French Renaissance designs, without dignity, without simplicity, without beauty of proportion or detail, one of those very costly buildings which carry no trace of their worth either on the exterior or interior.

The Auditorium is a building of which Chicago is proud, and it is undoubtedly a building of great merit in design and in execution.



New York Life Insurance Building, Omaha, Neb.: Private Architect. Total cost, $833,399; Cost per cubic foot, 39 cents; Time of Construction, 24 months.

The way in which the windows are grouped together, the good proportion between the solids and voids, and the simplicity of the whole treatment are notable points.

Chicago Custom-house. While Chicago is proud of her Auditorium, she is equally ashamed of her Custom-house and Sub-treasury, which is both poorly built and poorly designed — small windows, curious pilasters, insignificant arches, ugly roof and dormers. The appropriations for repairs on this building have been nearly $500,000. The Auditorium is much more elaborately finished on the interior than the Government building.[1]

In Kansas City, Mo., quite recently, the New York Life Insurance Building has been erected; it, with its sister building in Omaha, are two of the prominent new buildings of the country: Renaissance



Allegheny County Court-house, Pittsburgh, Pa.: Private Architect. Total cost, $2,400,000; Cost per cubic foot, 30 cents; Time of Construction, 43 months.

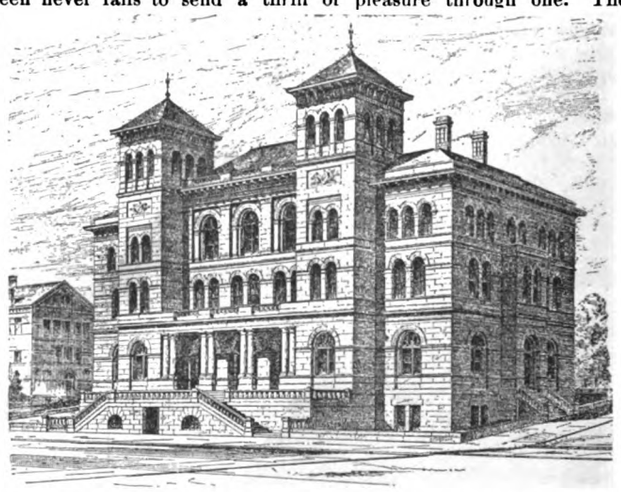
in design, classically proportioned, not having that tendency to over-ornamentation, which, unfortunately, so many modern buildings have.

The Kansas City Government Building is simple in its design: two small towers, with nothing to dignify it in the proportions and an awkward treatment of the central mass. The whole rather suggestive of a public school.

The designs chosen for the above comparisons have not been selected for their poverty, but simply because they were of the number of which I had data as to their cost, and so could be compared with the private buildings in the list.

As a matter of fact, I think several of the buildings were designed during the most successful period of the Supervising Architect's office, and in looking at the views in connection with the private buildings one may consider that they are comparing a few of the good private buildings with the best era in the Supervising Architect's office. After 1885, designs show a decided deterioration, as will be seen by the views shown of designs made in the Supervising Architect's office during the years 1886, 1888, 1890, 1891, 1892. Some of these designs would properly find place among your list of aberrations: there is not one of them which has points that would commend it to any one of good taste.

I feel constrained to call attention to some excellent work which has been done in Washington by private architects. First, the Capitol, than which there are few, if any, more imposing buildings in the world. The dome is a thing of beauty, of which you are constantly catching glimpses, and which no matter when or where seen never fails to send a thrill of pleasure through one. The



United States Court-house and Post-office, Kansas City, Mo.: Supervising Architect's Office, 1879. Cost per cubic foot, 48.8 cents; Time of Construction, 96 months.

dignified proportions and refined detail of the whole never pall upon you: while the War, State and Navy Department designed in the Supervising Architect's office (by special act of Congress) is distressing in its small masses, apparently jumbled together, small columns, small windows, awkward mansard roof, and coarse, meaningless details. Compare this with the Treasury Department building, designed by a private architect by special act of Congress.

[1] Very elaborate views of this are published in *Architectural Record* No. 4.

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Take the Post-office Department building, designed years ago, a good example of a Classical building, simple, yet refined. It has been suggested that this building be ruined by the addition of several incongruous stories and a monstrous roof. Compare this with the new Post-office, which has a decided Western aggressiveness in its whole appearance that is intensified by its prominent central tower. The treatment of the roof and dormers is unfortunate, the corners of the pavilions which are pierced with small windows, instead of intensifying and strengthening the effect, give them an apparent weakness.



Original Design for United States Court-house and Post-office, El Paso, Texas: Supervising Architect's Office, 1888.

Compare this with the Allegheny County building, both of them being designed in what is called modern Romanesque, and see how marked the difference is in the proportion and general effectiveness of the two.

One of the most conspicuous examples of the lack in artistic, and we might go farther and say of educated, feeling was shown at the World's Columbian Exposition where the Government Building, although more expensively erected, and possibly better constructed than the other buildings, was a source of mortification to those who felt pride in having their country show to advantage. The dome and pavilions of the building were wanting in good proportion, the details were crude, and not appropriate, and to complete the disagreeable impression produced, a pall was thrown over one's feelings by painting the dome black, and the building a disagreeable gray on the exterior. On the interior the columns were painted a variety of tints, green, red, etc., and marbleized. The other main buildings of the Fair, designed by architects selected for their known capacity, were remarkable the world over as examples of what the profession in this country can accomplish when the best men are obtained. Although some of these buildings were much better than others and all probably had points that could be criticised, yet, as a whole, no country or time has had such a magnificent, I should further say refined, educated and beautiful, architectural display.

Why may not the talent of the country be brought together to produce lasting and educative effects in the same way? Why can we not have in Washington a permanent, a more beautiful "Court of Honor," with the new public buildings grouped around it? The Capitol is beautiful in itself, and by itself, showing the wise selection of a good architect. The Capitol is also at the head of a system of parks which might be used with advantage as a centre, around which the buildings could be grouped. Connecting with this system of parks is nine hundred acres of reclaimed land which borders on the Potomac, and where any desired water-effects can be obtained in connection with the buildings. It is possibly to be regretted that the Fair was not held here, and some of the principal buildings made permanent and used by the Government. The only objection to such a proceeding would have been the doubt of Congress managing the scheme on as broad and as artistic a basis as was followed in Chicago.

The office of the Supervising Architect has had, and still has, a large number of capable and efficient men in the draughting and construction department. Under the regulations of the office, such men apparently have little opportunity to show their ability, and as soon as an opening is found outside, they leave.

The conduct of the office is no reflection upon any individual Supervising Architect, as all acknowledge that they can only find time for the veriest routine work.

I think from the facts shown that all will acknowledge the need of a thorough reorganization of the system. To attain this, the work must be given to the most capable private architects. Architects who had Government work might serve as a Board to discuss and act upon questions of taste in connection with buildings. They might possibly serve as a jury to select designs in cases where they were not competitors.

How will the system, as advocated in the bill passed by Congress, or a modification of it, become operative in this country?

The Secretary of the Treasury must first appreciate the merits of the scheme and the Supervising Architect must be in sympathy with the idea; or the profession of the country must so present the matter to Congress that a bill will be passed, making the enforcement of it mandatory. In the last day or two (March 31) the



United States Court-house and Post-office, El Paso, Texas: Supervising Architect's Office, 1890.

Secretary of the Treasury has submitted to Congress amendments to this bill *which appear designed to destroy all good effects that would arise from it:* the working-drawings and supervision to be carried out by the subordinates in the Supervising Architect's office. This would prevent the capable men of the profession taking part. *Further, he leaves the question of fee open, suggestive of the "lowest bidder" making the design.*

I suppose there is little question that the demands of the Country require a bureau to have charge of all art matters, to be composed of architects and artists, who shall select the designs of all buildings, paintings and sculpture that the Government may at any time buy, build or acquire.

Glenn Brown.

THE CORRESPONDENCE BETWEEN THE SECRETARY OF THE TREASURY AND THE PRESIDENT OF THE AMERICAN INSTITUTE OF ARCHITECTS.

[Exhibit A.]

Office of the President, A. I. A.,
Chicago, Ill., February 14, 1894.

To the Honorable John G. Carlisle,
Secretary of the Treasury, Washington, D. C.

Dear Sir, — About one year ago, at your request, Messrs. R. M. Hunt, Charles F. McKim and President Kendall of the American Institute of Architects called on you in Washington regarding the bill regulating the employment of architects for Government work. At that time you had an interview with them, and assured them that you agreed with the American Institute, that every Government building thereafter should be built upon plans selected through competition among the architects of the country.

In November last, the Secretary of the A. I. A. wrote to the Supervising Architect of the Treasury on the same subject, and received the following answer:

Washington, D. C., November 11, 1893.

Mr. Alfred Stone,
Secretary of the American Institute of Architects, Providence, R. I.

Dear Sir, — I beg to acknowledge the receipt of your letter of the 6th inst., relating to the law giving the Secretary of the Treasury authority to obtain plans for Government buildings by competition, etc.

Referring to that passage in your communication in which you inquire whether it "is not possible to find some way to overcome the prejudices of the Secretary of the Treasury, if he is prejudiced against it, or of finding means to induce him to institute competitions on several of the very important buildings ordered by Congress," I have to remark that I have no reason to believe that there is, or has been, any reason for deferring action in this matter, beyond the fact that the Secretary's time has been so fully occupied by public business of the most pressing character that he has not been able to give the law in question the consideration necessary to putting in operation the methods therein contemplated.

Respectfully yours, (Signed) J. O'Rourke,
Supervising Architect.

On these assurances the officers of the Institute rested. In the interview I have mentioned above, you mentioned the Buffalo building as one which might be designed under the new bill, and the country has been looking forward to your taking action in this direction at an early date.

On January 9, 1894, the Board of Directors of the Institute met in New York, when a cut was presented, through their Buffalo Chapter, showing a design for the proposed Buffalo building. It was stated to the Board that it had been completed by the Supervising Architect of the Treasury after he had written to Mr. Stone as above quoted.

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Though the Board had understood that a competition was to be had for the Buffalo building, I believe no protest would have been sent to you concerning it, but for the fact that the design was unanimously considered to be inferior and unworthy for the purpose. The protest sent to you was signed by the President, the Vice-President, the Secretary and a large number of the Directors of the Institute, and read as follows:

January 9, 1894.

To the Honorable John G. Carlisle,
Secretary of the Treasury.

Dear Sir, — At the annual meeting of the Directors of the American Institute of Architects, held in New York on January 8, 1894, a cut from a newspaper was submitted by its Buffalo Chapter, purporting to represent "a design adopted by the Honorable Secretary of the Treasury for the proposed new Federal Building for the City of Buffalo."

The Directors of the Institute believe it to be their duty to their profession, and to the whole community, to protest. Any structure of the general character of the design represented by the cut in question, if carried into execution, will be found absolutely wanting in the fundamental elements which go to make a public building, and will be condemned by the community.

We, therefore, respectfully urge that you use your power to prevent the construction of this design. We have the honor to be Very respectfully,

To this communication no reply was written, but individual members of the Board each received a copy of a letter, addressed to him in his private capacity, the original of which was an official letter sent to Mr. Alfred Stone, "Secretary of the Institute." It read as follows:

Washington, D. C., January 17, 1894.

Mr. Alfred Stone,
Secretary A. I. A., Providence, R. I.

Dear Sir,— The Honorable Secretary of the Treasury has referred to me a rather clumsily-folded communication, without official heading, accompanied by a design, cut from a Buffalo paper, of "Proposed Federal Building for Buffalo," enclosed in an office envelope of George B. Post, architect, New York, purporting to be a protest of the Board of Directors of the A. I. A., adopted at a meeting held in New York on the 8th inst., against the adoption of the said design, signed by D. H. Burnham, President, George B. Post as First Vice-President, Levi P. Scofield, Second Vice-President, yourself as Secretary, and several other members of the A. I. A.

This communication is of such an unusual and extraordinary character, based on *ex parte* and indefinite information, and so at variance with professional courtesy and good breeding that, in justice to the A. I. A., I hesitate to believe in its legitimacy, and request that you will kindly advise me by return mail if it has really emanated from the Board of Directors of the A. I. A.

On receipt of your response I shall give the matter the attention which it may deserve. Very respectfully yours,

(Signed) Jeremiah O'Rourke, F. A. I. A.,
Supervising Architect.

The Supervising Architect in this communication states that the letter of the Board to yourself was of an unusual and extraordinary character, based on "*ex parte* and indefinite information," the inference being that the design shown by the newspaper clipping was not made by the Treasury Department, or that it did not truly represent the latter. I am now in possession of the Annual Report for 1893 of the Supervising Architect, and find that its frontispiece is the identical design enclosed to you; both were evidently made from the same original drawing. Our information, therefore, was exact and authentic, instead of being based, as stated by the Supervising Architect, on that which was "*ex parte* and indefinite."

Mr. Stone replied as follows:

Providence, R. I., January 19, 1894.

Mr. Jeremiah O'Rourke,
Supervising Architect, Washington, D. C.

Dear Sir,— Your favor of the 17th received and contents noted. At the meeting of the Board of Directors, holden in New York on the 8th and 9th inst., a communication was received from the Buffalo Chapter, containing a cut from a Buffalo paper of the proposed Federal Building for Buffalo and asking for some action in the matter upon the part of the Directors. The matter was fully considered and discussed by the Board of Directors, and a letter was sent to the Honorable John G. Carlisle, Secretary of the Treasury, upon the subject, and the letter was forwarded to Washington by Messrs. S. A. Treat and W. W. Clay. I do not know whether they delivered the letter to Secretary Carlisle in person, or not, but should have supposed that if they did not, it would have been accompanied by some letter. Had a communication to Secretary Carlisle been sent by mail, I should have written him an official letter giving him the facts above stated.

You will notice that the letter states that the cut represents what purports to be a cut of the proposed Federal Building for Buffalo. If it is not a cut of the proposed building, then the criticisms, of course, do not obtain. If it is, or if it is reasonably near to what is proposed for Buffalo, then I think that the opinion of the Board would remain unchanged. It is very much to be regretted that the building at Buffalo should not have been the occasion of such a competition as was contemplated by the so-called Tarsney Bill, and I would add that it was supposed by the gentemen who saw Secretary Carlisle last winter, that it was his intention to inaugurate the scheme by putting the Buffalo building out to competition.

I do not understand that this committee thought that Secretary Carlisle absolutely promised the committee such a course, but the impression made upon them at that time was that that was his intention.

Yours truly, (Signed) Alfred Stone,
Secretary.

Since that time no further action seems to have been taken in Washington until the Executive Committee of the Institute called on you, February 5.

The Buffalo Chapter, through its Secretary, Mr. J. R. Porter, finding that there was no action being taken, and having been strongly urged by the people of Buffalo, the citizens of the country at large and by the whole architectural profession, requested that the Executive Committee lay these matters clearly before you in Washington, at once. That we state the case to you and explain the rights of the profession under the law of 1893, and the undoubted wishes of all intelligent people in the country. To this end I wrote you on January 31, and wired on February 3, requesting you to give us a hearing, and stating that the Executive Committee would be in Washington on the 5th inst. The members convened there on the day agreed. At 11 o'clock a note came from your Private Secretary, which read as follows:

February 6, 1894.

Mr. D. H. Burnham,
President A. I. A., Arlington Hotel, City.

Dear Sir,— I am directed by the Secretary to acknowledge receipt of your letter and telegram, asking for a hearing before him to-day, relative to the proposed plans of the public building at Buffalo, N. Y., and in reply thereto, I have to inform you that his engagements for to-day will not permit him to give you the hearing you request. He has, however, referred your correspondence to Hon. Jeremiah O'Rourke, Supervising Architect of the Treasury Department, and has authorized him to confer with your Committee about the above matter.

Very respectfully,

(Signed) H. W. Van Senden,
Private Secretary.

It was difficult for the members to unite on a time to meet in Washington, because all of them have important interests in hand. They did not go for private ends, but for a purpose in which the community is now deeply interested. It was a disappointment that you were not able to see them, as you had previously urged the same men to call in reference to this matter and had then intimated that you would communicate with the profession, or its representatives, from time to time regarding the law. They were placed in an embarrassing position as they could not meet Mr. O'Rourke until he had withdrawn his letter to Mr. Stone, dated January 17th, which reflected upon their official action in a manner which is felt by the entire Executive Committee to be insulting to them.

The Committee, however, was met by the Assistant Secretary of the Treasury, Mr. Curtis, who received them in a very satisfactory manner. He explained frankly the status of the case and the difficulties in the way of taking action under the law as it stands.

After consultation with him the Committee had a clearer understanding of the subject and concluded that it was not necessary to see you personally on that day, but that a better course would be to prepare a memorial, covering the points raised by Mr. Curtis, and which we understand to represent your views.

He told the Committee that the design of the Buffalo building had been withdrawn from the Postmaster-General's office, where it had been sent for approval, and gave us to understand that, awaiting our further communication, work would rest where it was, and then made the following points, viz:

1. That it will cost more for architectural fees if outside men are employed, instead of proceeding in the old way through the Supervising Architect's office.

2. Since the bill was passed, which gives you authority to employ outside men, Congressmen have claimed the right themselves to nominate the architects to be employed for each place and are very generally opposed to the competition system, all of which adds to the difficulty of taking the action contemplated by the law, and for which purpose principally, it was passed.

3. That you are now urged to proceed with the building in Buffalo and elsewhere, in order to furnish work to the unemployed people.

4. That there is no scheme or code prepared, on which a competition can be conducted.

Since leaving Washington I received the following letter from Hon. Jeremiah O'Rourke, the Supervising Architect of the Treasury, viz:

Washington, D. C., February 6, 1894.

Mr. D. H. Burnham,
President A. I. A., Arlington Hotel, Washington, D. C.

Dear Sir,— The Honorable Secretary of the Treasury has referred to me your letter from Chicago of January 31, and your telegram of February 3, also telegram of same date from Chicago of Mr. John R. Walsh, relative to Buffalo Federal Building, etc.

I beg to assure you that I am now, and always have been, entirely favorable to a satisfactory solution of the interesting, but somewhat complicated problem of putting into practical effect the provisions of the Act approved February 20, 1893, authorizing the obtaining of plans for public buildings under competition, and that I shall be much pleased to meet you or the Executive Committee of the A. I. A. at any convenient time for conference and mutual exchange of views on this subject. Very respectfully yours,

(Signed) J. O'Rourke,
Supervising Architect.

To this I replied as follows:

Chicago, Ill., February 9, 1894.

Mr. Jeremiah O'Rourke,
Supervising Architect, Treasury Department, Washington, D. C.

Dear Sir, — Your valued favor of the 6th inst., sent in care of the "Arlington" reached that hotel the day after I left Washington and was laid on my table this morning. Please accept my thanks for the contents, which I have carefully noted.

I regret exceedingly that the conference which you propose between yourself and the officers of the A. I. A. is impossible. It can only be made so by the preliminary withdrawal, on your part, of the official letter dated January 17, signed by yourself as "F. A. I. A." and "Supervising Architect," and addressed to Mr. Alfred Stone as "Secretary A. I. A.," in which you refer to the document signed by Directors of the American Institute of Architects as " at variance with professional courtesy and good breeding," etc., etc.

I sincerely hope you will withdraw the letter I refer to, and also the copies sent to the members of the Directorate. I am sure you will gain the esteem of all men of the profession by taking this course.

By order of the Executive Committee of the Institute I am putting together the suggestions made by them on Monday, in the form of a memorial, which is to be forwarded to the Honorable Secretary of the Treasury, because we were informed by Mr. Secretary Curtis that such a document was desired and expected, before taking action on the Buffalo building.

I have the honor to remain, Faithfully yours,

(Signed) D. H. Burnham,
President A. I. A.

By the above statement of facts you will be able to review the history of the case down to the present date.

I now have the honor of taking up the points brought out in the interview with the Honorable Assistant Secretary, in Washington on February 5. The gentlemen of the Committee of the Institute who were present on that occasion were Mr. George B. Post of New York, Mr. E. H. Kendall of New York, Mr. Chas. F. McKim

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of New York, Mr. Arthur Rotch of Boston, Mr. Wm. W. Clay of Chicago, Mr. Samuel A. Treat of Chicago; each of them would be regarded as a competent critic of architecture, and there can be no doubt as to their fairness.

The design of the Buffalo building, which is so often referred to in the above papers, was examined by them with a view of suggesting changes to bring it up to the proper standard for a structure of that nature. Their unanimous conclusion was that such a course was not possible; that to make the present design satisfactory would involve changes so extensive as really to produce a new design; that it would, therefore, be better to start *de novo*. In short, it is the opinion of the Committee that the defects in the design, for the purpose, are radical.

The Government paid out in 1893, for its buildings and repairs, apart from purchases of ground, about $3,200,000. The total expenses of the Supervising Architect's office for 1893 were $198,000, or six per cent on the cost of the work actually done.

The price for the same service by the best men in the country in private life is five per cent, or one per cent less than the actual cost to the United States for the same thing in 1893. This one per cent ought to very much more than cover the cost of the services, which, under the bill, the Supervising Architect would still have to furnish, *i. e.* that of estimating, inspecting of accounts, auditing, and such superintendence as would be needed to supplement that done by the architects themselves. Any reputable architect would consider it extremely extravagant if he found that the service left under the Bill to the Supervising Architect had cost him in his private practice one per cent of the value of the buildings themselves. Instead of its costing the Government more for architectural service if private practitioners be employed, the cost will be reduced and there will be a considerable saving.

The entire profession of architecture desire to have the proposed building for Buffalo thrown open to competition, which shall include the architects of the country. This, I am informed, is also the wish of the profession in Buffalo. From what little agitation there has been in that city, it is evident the people there are quite as eager that this course should be pursued as are the architects themselves, and it can be proved to you that Congressmen from that place can only represent their people properly, by advising it.

The people are no longer ignorant regarding architectural matters. They have been awakened through the display of the World's Columbian Exposition of 1893, where it was generally remarked that the Government building was inferior to any of the other large structures.

The question the people of Buffalo now ask is not "Can the Act of Ninety-Three be improved?"; they know that as it stands, you have the power to order a competition for their building. They have the opinion of the Board of Directors of the Institute that the design made in Washington is improper, and they believe this themselves. They ask you to take the step which the law authorizes, thus ensuring a noble monument, which may be forever a pleasure and pride to the city.

And to this end, by authority of the Executive Committee of the Institute, I have the honor to state that the members of the American Institute of Architects will compete for this Buffalo building without pay, except to him whose design shall be chosen.

I think the Assistant Secretary was mistaken about the urgency of the Buffalo people to have the building started at once, because of the need of furnishing employment to laborers. I have had a number of clippings from the Buffalo papers, some of them being editorials, in which this position is strongly controverted.

It is felt there that it would be poor economy to push forward an improper design, in order to furnish work a few days earlier for the small number to be employed, and although there is sympathy for the unemployed, this course would ultimately cost the city a price which it is not willing to pay. The competition can be carried through in an exceedingly short time, if you will order it. The exigency of the case would be considered by the architects, and they would be willing to prepare plans much quicker than could ordinarily be expected of them.

I have already said that the architects themselves will agree to furnish a full and satisfactory competition for this special case, without cost to the Government. We are also ready to assist the Government in the arrangement of a code for the competition. This matter of "Competitions" has been studied from time to time by very able architects, and a code for conducting them has more than once been printed. I attach one, considered to be satisfactory, which I have changed to adapt it to the Buffalo case [The code in question is here omitted for lack of space.] I respectfully suggest that the twelve competitors called-for by the code be nominated as follows: —

By yourself, out of a list furnished by the Institute . .	6
By the Buffalo Congressmen	3
By the Buffalo Chapter, A. I. A.	3
Total	12

I would suggest that the plat to accompany the competition code shall show: —

(1) Streets: width and grade (2) sidewalks: width and grade, (3) sewers: size, depth and pitch, (4) quality of earth for foundations, (5) water-pipes: size and location in street, (6) gas-pipes: size and location in street, (7) angles: (number of degrees) at corners, (8) houses now on lot, (9) profile of lot, (10) necessary restrictions (if any) under city laws of Buffalo, (11) scale of plat, etc., etc., etc.

This code will, of course, need your revision, and in that case the officers of the Institute will be glad to go to Washington and advise with your subordinates regarding it.

There is a matter of importance which I cannot find has ever been brought to your attention, *i. e.*, that the Government buildings are said to cost more per cubic or square foot than the same sort of structures in private practice.

I am having a table made, showing comparative cost of Government and private work of a similar nature. I desired to delay this memorial until I could lay before you the evidence of the necessity of employing skilful architects, because of the economy to the Government, but have concluded to send the paper in, and follow it with the tables as soon as they can be completed. It seems to us that for this cause, if for no other, the change we ask should be made.

I note by the public press that the Supervising Architect recently informed Assistant Secretary Curtis that it will take three years and a half for his office, as now constituted, to design the buildings already authorized. If this be approximately true, the retaining of a number of the most able architects of the country to assist him, is imperative and urgent.

I now have the honor to request you to name a day when the Executive Committee of the Institute may be heard by you on the questions covered by this memorial. We offer to assist in placing its architecture upon the footing demanded by the country. We will serve without pay, giving our best endeavors to the work.

I have the honor to remain, Yours faithfully,

(Signed) D. H. BURNHAM,
President A. I. A.

[EXHIBIT B.]

WASHINGTON, D. C., March 6, 1894.

MR. D. H. BURNHAM,

President A. I. A., The Rookery, Chicago, Ill.

Sir, — I have to acknowledge receipt of your communication of the 1st ultimo, relating to the action desired by the Institute of Architects on the part of this Department for the purpose of executing the Act of Congress, approved February 20th, 1893, and covering memorial and code of procedure in the competitions authorized by said Act.

The memorial has received careful consideration, and I am constrained to say that it does not contain such suggestions as will enable the Department to overcome the difficulties briefly stated to your committee by Assistant Secretary Curtis, as specified on the eighth page of the memorial.

Furthermore, the memorial is confined exclusively to elucidating a plan for the competition only, and leaves without discussion, and unsolved, all the principal obstacles in the way of putting the Act referred to in force.

As the experiment may be tried with some other building, quite as well as with the Buffalo building, and as the Department is now ready to proceed with the working-drawings for that building, it seems unnecessary and inexpedient to delay its construction pending the further consideration of the matter, especially as it is evident that additional legislation will be required to enable the Department to proceed with all proper safeguards to the interests of the Government.

It has, therefore, been determined to proceed with the work in accordance with the design prepared by the Supervising Architect, which is satisfactory to the Department, and which, it is believed, will, when carried into execution, meet the approval of the public.

This decision must not be accepted as indicating the opposition of this Department to the general purposes of the Act of February 20, 1893. On the contrary, I will favor any practicable method by which the Department can avail itself of competition for the elevation and improvement of the architecture of our public buildings.

While it would afford me pleasure to have another interview with the members of your Institute, in view of the decision reached in the pending matter, I suggest that it is unnecessary to have another conference, unless you are prepared to suggest such additional legislation as will accomplish the purposes you desire.

Very respectfully, (Signed) J. G. CARLISLE,
Secretary.

[EXHIBIT C.]

AMERICAN INSTITUTE OF ARCHITECTS,

OFFICE OF THE PRESIDENT,
THE ROOKERY — CHICAGO, ILL., March 9, 1894.

TO THE HONORABLE JOHN G. CARLISLE,

Secretary of the Treasury, Washington, D. C.

Sir, — I am astonished by the contents of your letter of March 6, just received. I am, however, informed that it was prepared by the Supervising Architect of the Treasury, and I observe that it was signed for you by one of your secretaries.

Its statements are very inaccurate, and I gladly believe that it has not passed your scrutiny. The proposed change is not the action desired by the Institute of Architects alone. It is one in which the country is deeply interested.

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You yourself inaugurated it when you sent for a committee from the Institute one year ago. At your request the most eminent men in the profession visited you, headed by the President of the Institute. You told them then that you were in accord with them regarding the law which had just been passed.

At that interview you yourself brought up the Buffalo Post-office as a case in which the law might first be tried. The architects of the country favor the change, as do all intelligent citizens. It is not a private measure of theirs, but one in which you yourself took the initiative.

I quote from your second paragraph: "the difficulties briefly stated to your Committee by Assistant Secretary Curtis, as specified on the eighth page of the memorial."

I do not understand why the letter juggles with words.

Your Department stated the objections and they are written in the memorial on page eight and numbered from one to four inclusive. You now say "the memorial is confined exclusively to elucidating a plan for the competition only, and leaves without discussion, and unsolved, all the principal obstacles in the way, etc."

Page eleven of the memorial starts with the sentence, "I now have the honor of taking up the points brought out in the interview with the Honorable Assistant Secretary, etc.," and then goes on to carefully discuss each of them and solve the difficulty.

I will emphasize what I there said.

Principal Obstacle No. 1. — Was the claim of your Department that it will cost more to employ outside architects than under the present system.

I showed on page eleven that your expenses now are eight per cent of gross cost of building and repair work as per Annual Report of Supervising Architect's office for 1893.

I have just been told by a former, and recent, holder of that office, that in his day the Government buildings cost not less than nine per cent for the design and superintendence, and that it has long been the custom in the Supervising Architect's office to charge each job for designs and draughtsmanship as a part of the cost of the whole. Now as the annual report does not go into detail, but shows simply the gross cost of each building, the real Government expense for architectural work is much in excess of the gross sum stated in the Annual Report as the expense of the Supervising Architect's office. In the memorial, eighteen lines are devoted to the discussion of this "principal obstacle" number one.

Principal Obstacle No. 2. — Was the claim of your Department, that congressmen stood in the way because they demanded the right to appoint the architect, each for his own particular locality.

The memorial meets this by suggesting in the code that congressmen may appoint a part of the competitors in each case. Therefore, the memorial fully meets this point also.

Principal Obstacle No. 3. — Was that the people of Buffalo were urging you to proceed with their building in order to quickly furnish work to unemployed men. The memorial devotes eighteen lines to this item, on page twelve. It discusses the matter fully and shows, what you must now more thoroughly believe, that the Buffalo people do not wish to have any action of this sort taken, but that they do desire to have a beautiful and fitting building.

Principal Obstacle No. 4. — Was that no scheme or code had been prepared on which competition could be conducted. The memorial contains a code worked out after Assistant Secretary Curtis had stated the trouble. This paper was prepared with much care and thought, and was forwarded to you promptly on the 14th of last month. The memorial also contains a statement to you that the members of the Institute will give, without cost, all the time that you may require of them to help the Department in the perfecting of the new system.

Is not this "principal obstacle" number four met by very many pages of the memorial?

The claim that the memorial does not discuss or solve the principal obstacles is absurd.

There is no business reason why the law may not be put in force at once, nor has there been, that I am able to discover.

The working of the Supervising Architect's office is not a freemasonry requiring specially trained adepts to undertake it. It is a simple organization which any good business men, with a knowledge of building, can understand and operate, and I venture to assert that if the good-will to do so were present in your Department, the organization of the office on the basis of the present law, which gives you the right to employ the best designers in the country, could be brought about in a few weeks, and that it would then be better than the present one.

I do not forget the protestations of the Supervising Architect, of his readiness and anxiety to do all in his power to forward this important matter. I am aware that you yourself stated to the gentlemen of the Institute that you were in hearty accord with them on the subject; I am also aware that twelve long months have since passed, during which nothing whatever has been done in your Department looking toward the carrying out of this law, except at the eleventh hour when Mr. Secretary Curtis stated to a committee the four principal obstacles which were in the way.

The obstacles are not real ones and never were, and after carefully looking over the ground I can see no others, although I am tolerably familiar with the workings of the Supervising Architect's office in Washington, and entirely familiar with the law on the subject. You now inform us, in effect, that the law must be amended before you will act under it. I can see but one amendment which is needed to insure the satisfactory working of this measure, *i. e.*, the introduction of a clause ordering the Secretary of the Treasury to carry out its plain intent and purpose, and not leaving it to his discretion.

I have the honor to remain, Yours faithfully,

(Signed) D. H. Burnham,
Presiden', A. I. A.

[Exhibit D.]

Washington, D. C., March 12, 1894.

Mr. D. H. Burnham,
President A. I. A., The Rookery, Chicago, Ill.

Sir, — Your very offensive and ungentlemanly letter of the 9th instant is just received, and you are informed that this Department will have no further correspondence with you upon the subject to which it relates, or any other subject.

Very respectfully, (Signed) J. G. Carlisle,
Secretary.

Illustrations

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

Government *vs.* Private Architecture: Private Work. The Metropolitan Life Insurance Building, Madison Square, New York, N. Y. Messrs. N. Le Brun & Sons, Architects, New York, N. Y.

[Gelatine Print issued with the International and Imperial Editions only.]

Government *vs.* Private Architecture: A Group of American Private Buildings by Private Architects.

Government *vs.* Private Architecture: A Group of Foreign Public Buildings by Private Architects.

Government *vs.* Private Architecture: — Government Work. Main Entrance to the U. S. Government Building, World's Columbian Exhibition, Chicago, Ill. Mr. W. J. Edbrooke, Supervising Architect of the Treasury Department.

[Additional Illustrations in the International Edition.]

Government *vs.* Private Architecture: — Private Work. Main Entrance to the Electricity Building, World's Columbian Exhibition, Chicago, Ill. Messrs. Van Brunt & Howe, Architects, Kansas City, Mo.

[Gelatine Print.]

Government *vs.* Private Architecture: — Private Work. Detail of the Metropolitan Life Insurance Building, Madison Square, New York, N. Y. Messrs. N. Le Brun & Sons, Architects, New York, N. Y.

[Gelatine Print.]

"Thing Hall," Hereford, Eng. Messrs. Speakman & Hickson, Architects.

House, St. Mary's Road, Long Ditton, Eng. Mr. J. Nixon Horsfield, Architect.

Design for Great Roman Bath, Bath, Eng. Mr. C. E. Davis, Architect.

Notes & Clippings

Steel Wool. — One of the very latest importations to this city is a new product from German mills, called "steel wool." As its name indicates, it is composed of fine steel threads, but so soft and pliable as to entirely deceive the touch as to its true character. It is to be used in place of all grades of sand-paper, and those who have seen it say it is cheaper and more satisfactory than that article. With it, it is possible to dress the surface of the most intricate carvings without any trouble, as it easily follows the inequalities of surface when rubbing. It will also be of use in domestic economy and, when used with ammonia, is said to clean floors, bath-tubs, etc., in a manner that is astonishing. — *Cincinnati Commercial-Gazette.*

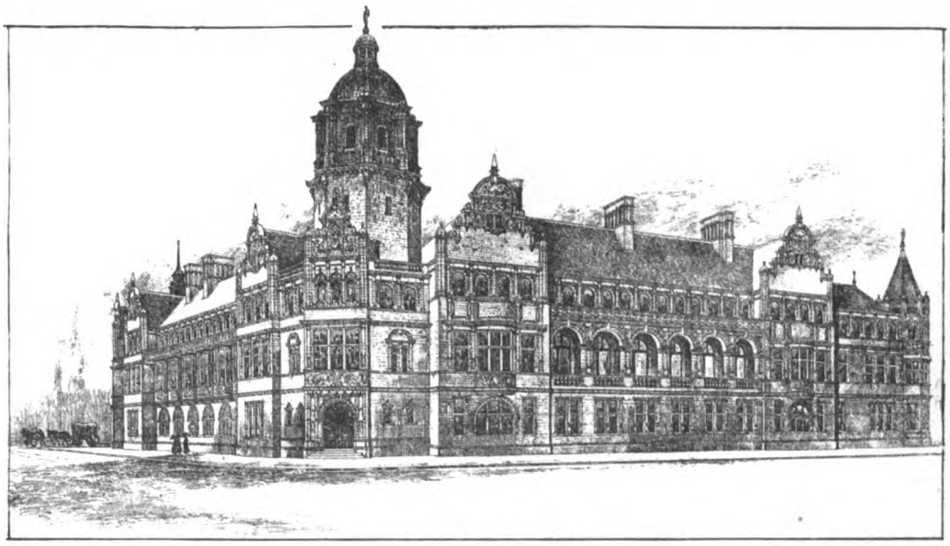
Why St. Andrew Undershaft was so named. — There is a church in Leadenhall Street, London, bearing the strange name of St. Andrew Undershaft. It seems that some 400 years ago, every May Day, a very high shaft or pole was set up opposite the south door of St. Andrew's and adorned with flowers. This pole was actually higher than the church steeple, which was, therefore, literally under the shaft for the time being, and led our ancestors to bestow upon the church a name which is quite unintelligible to those of their descendants who are ignorant of the history of the locality. — *Invention.*

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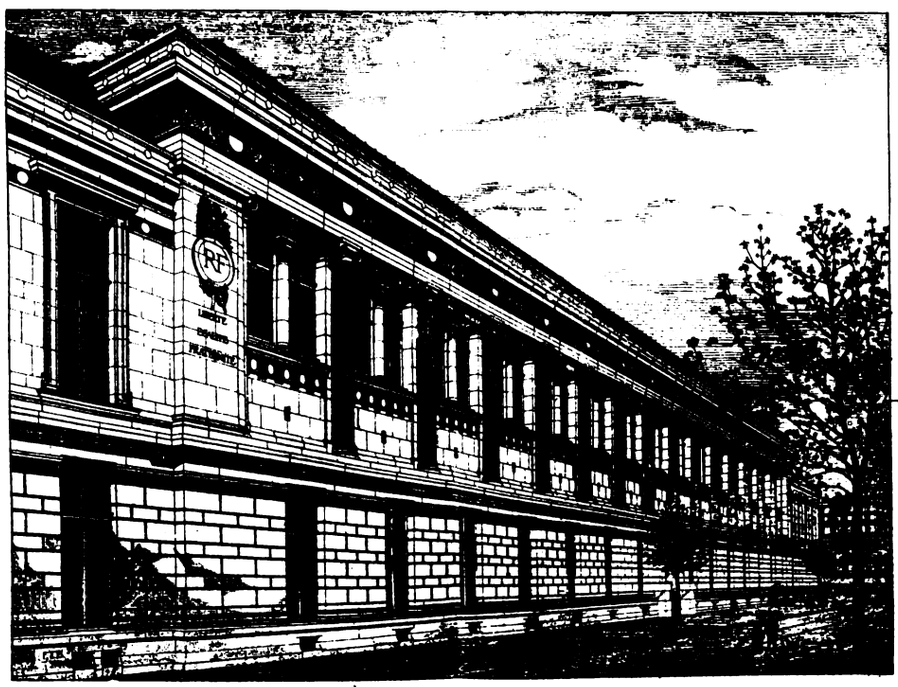
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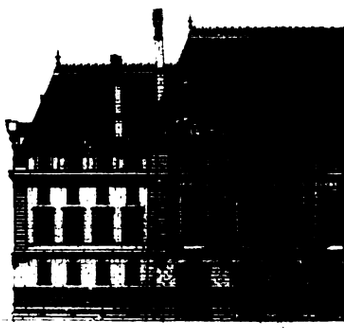
WAKEFIELD COUNTY COUNCIL BUILDINGS; ACCEPTED DESIGN.-GIBSON & RUSSELL, ARCHITECTS, LONDON.

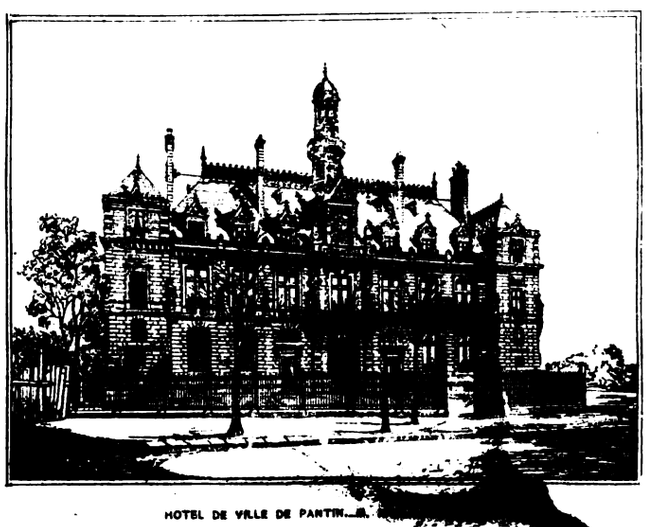


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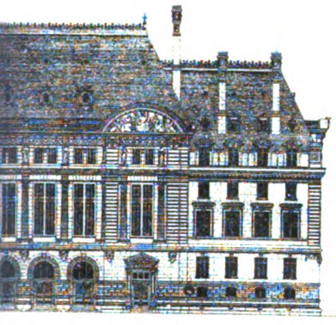
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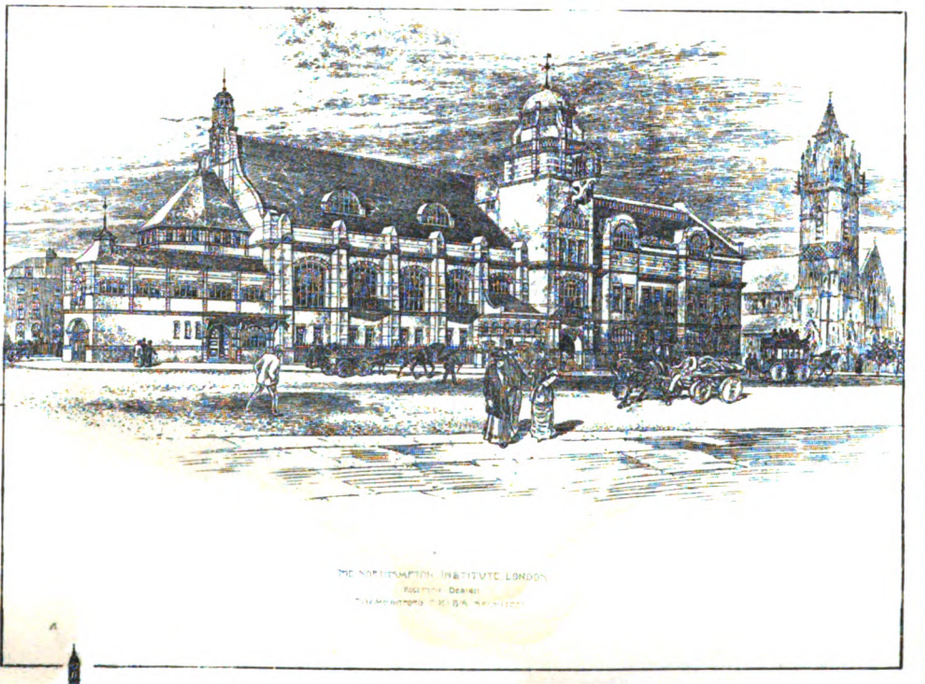


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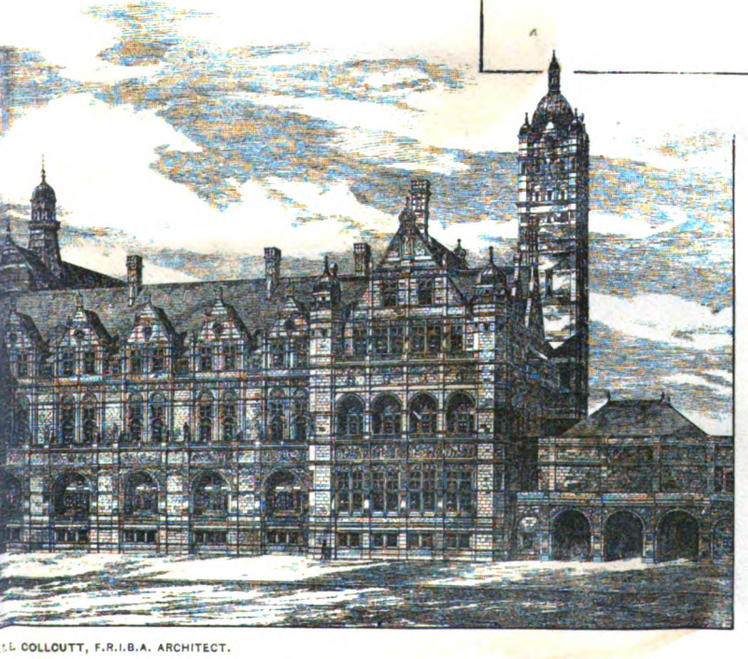


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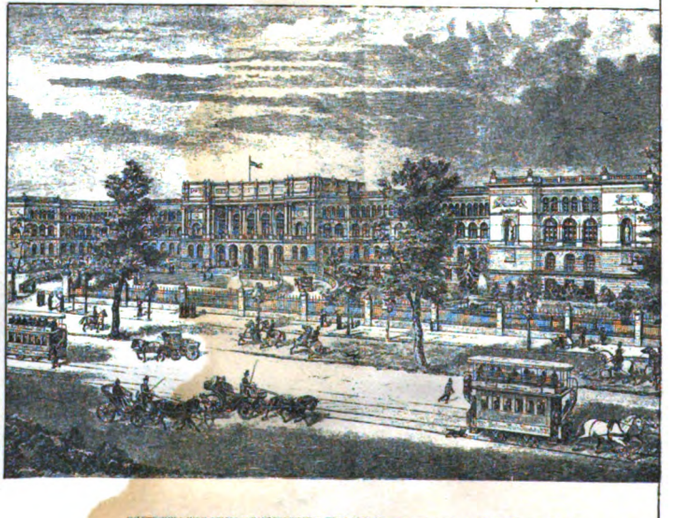




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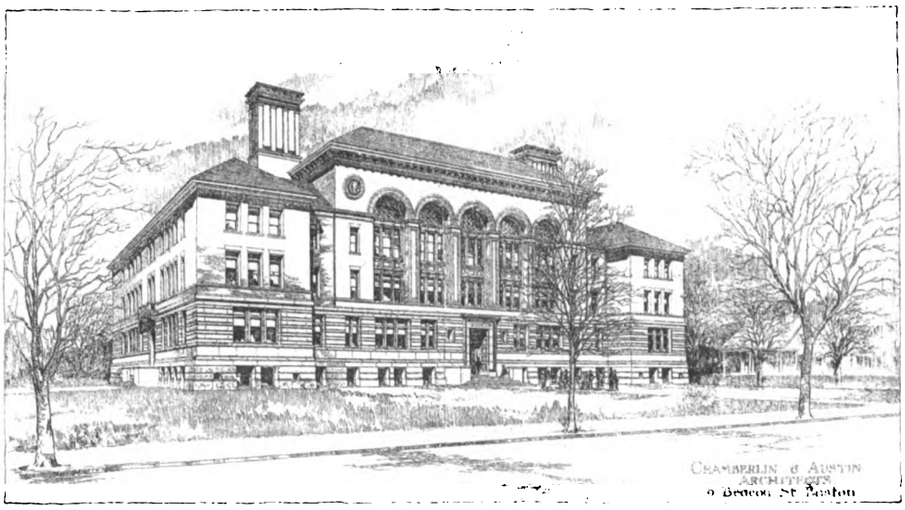
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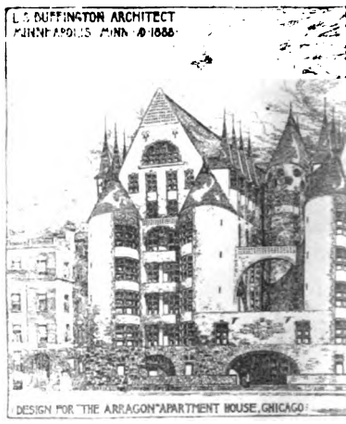
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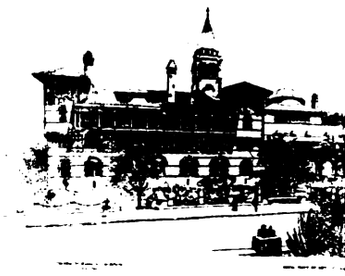


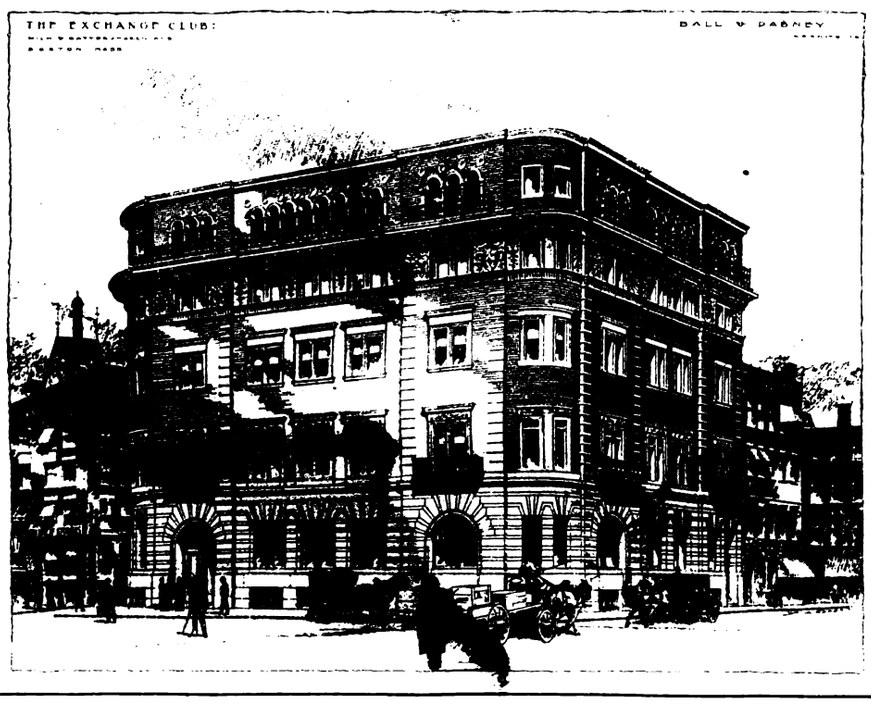
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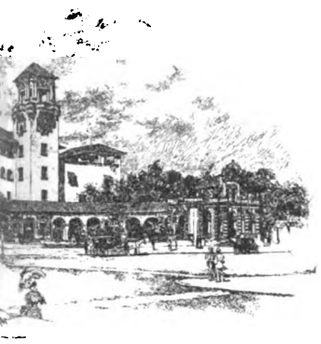


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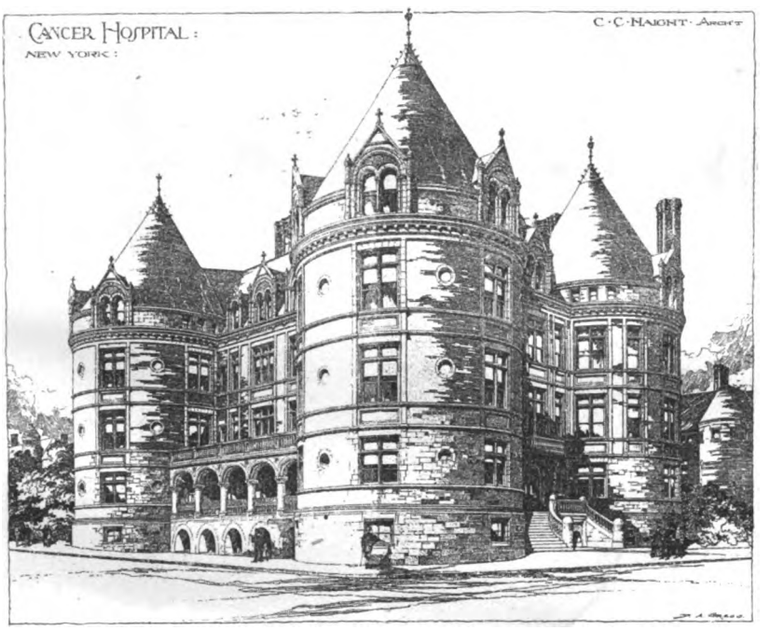
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GOVERNMENT VS. PRIVATE ARCHITECTURE.—U. S. GOVERNMENT WORK.

ENTRANCE TO GOVERNMENT BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILLINOIS.

W. J. EDBROOKE, Architect.

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APRIL 14, 1894.

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IT would seem as if the comparative statement as to Governmental and private building work made in our last issue must have an awakening effect on the authorities at Washington, to whose attention it was, of course, brought, and it would further seem that the statistical statements and tabulations of Mr. Brown's paper were hardly called for in the face of the impressive object-lesson afforded by the illustrations which accompanied it; but we fear greatly that neither the one nor the other will have the desired effect without a great deal of insistant effort on the part of the individual members of the profession and those of its lay friends who feel with them the great and real importance of the agitation which must now be begun anew and carried on aggressively. It should be the duty of every architect who has a friend connected with the daily press in any town — and who has not such desirable acquaintance? — to bring our last issue to his attention and urge him to aid in stimulating the aroused public opinion and in applying the lash to those at Washington who are wilfully blind. If this is done, something may be accomplished speedily; if it is not done, the political wire-pullers will find it the easiest of tasks to outflank the architects. To architects, or to most of them — for we must admit that there are architects who are not able to see wherein our Government buildings are not worthy specimens of architecture — it seems incredible that there can be two opinions on the matter of the architectural character of our Government buildings, but we must remember that there is nothing that the half-educated American resents so strongly as that any one should presume to give him instruction in matters of taste. As this is a common failing, it is certain that our legislators at Washington have their share of it, and we believe it hardly possible to make much impression by holding up before them one design which we tell them is good, and another which we assure them is bad. They will use their own taste in the matter, in spite of any argument we can use, and they will approve oftenest the one which seems to their taste the most showy. But if we cannot work upon them through their eyes, we may through their commercial perceptions, and, if it were not for politics as now practised, we might hope that they might be influenced by the proof presented in our last issue that present methods are unbusinesslike and extravagant. Politics, however, play so large a part in the matter, it can be so easily shown that the party in power must have jobs and offices at command in order to reward party service, that there is not too much reason to hope that much can be accomplished in the face of official opposition, unless it can be shown that a strong public opinion exists which positively demands the reform that architects seek to bring about.

UNTIL we had before us the full text of the correspondence that had passed between the Secretary of the Treasury and the President of the American Institute of Architects, we were disposed to think that the latter had shown want of tact and self-control, where the presence of these two qualities might easily have brought the negotiations to a more desirable issue. But the correspondence on the Treasury side appears to show, from first to last, a fixed determination not to allow the Secretary of the Treasury to be shorn of the smallest item of patronage, and to have sought every pretext for quibbling — from the manner of folding a letter to the absolute denying the existence of facts plainly stated. We now feel that there was a sort of rough-and-ready propriety in using the unusually plain language employed by Mr. Burnham in his last letter, as it was the means of bringing to the view of all a matter which has been too long conducted in the depths and labyrinths of officialdom. As we may be held to be prejudiced against the Government methods, and so our opinion on a matter of ethics may be considered unduly colored, it may be interesting to know how a layman regards this unfortunate correspondence, and so we quote the remarks of the Boston *Herald*, which says: "It is difficult to see how the latter [Mr. Burnham], when he found that the matter under discussion had been deliberately misrepresented in the last letter from Mr. Carlisle, was not bound, out of respect to his position as the official head of his profession, to reply as he did. . . . But when the Secretary, by his abrupt termination of the correspondence, tacitly assumes responsibility for the clear misstatements of fact that appeared over his signature, it is evident that if either party to this controversy merits the epithet of 'offensive and ungentlemanly,' applied by Mr. Carlisle in his last letter, it is not Mr. Burnham." It has its significance, too, that these words are not quoted from a Republican paper, hostile to the present administration, but from one that is distinctly friendly to it and its best intentions. We must, too, call attention to the cartoon, bearing on this subject, in the current issue of *Life*. Speaking plainly, this reform — one which is demanded by motives of economy, by the reasons there are for expediting the work, and by the true requirements of art, is now delayed solely by the action of two men, one of them a busy politician, overburdened at the moment by cares of the gravest moment, a man whom education and training do not fit to judge the matter at all from an æsthetic standpoint, the other his natural and responsible adviser upon such matters, who, after a brief experience of a little more than a year in office, has seen fit to give advice in absolute contradiction to the advice of his predecessors in the same office which had been reached by them during a much longer term of office, as the result of a far greater experience. It is impossible to escape the deduction that the responsibility for the delay rests less with the Secretary of the Treasury than with his Supervising Architect, whose advice is possibly instigated by his desire to defend his own design for the Buffalo building, the ultimate cause of the present dead-lock.

APROPOS of this building, we did not notice, until too late to correct the oversight, that in the hurry of gathering the material for the illustrations of our last issue, we had neglected to provide any illustration of the proposed Government building at Buffalo. The design, however, finds a place in another column this week. It also escaped our notice that we had included amongst the group of private buildings the design for the proposed City-hall at Boston, which was the work of the "city architect," and so afforded an excellent example of what official architects are capable of producing when the right kind of a man can be persuaded to take the place.

THE whole world of art will mourn the death of Sir Philip Cunliffe-Owen, the creator, one might almost say, of the modern artistic movement in England, through his unwearied zeal in collecting, and putting to practical use, the splendid treasures of the South Kensington Museum. At the time of the foundation of this great national museum, hardly

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anything remained of English art but a few mangled remains, over which the critics and sentimentalists were still growling and screeching. It occurred to Sir Philip Cunliffe-Owen, to Prince Albert, and a few others, that it might be advantageous for the English people to see for themselves what art was like, instead of depending on the critics' description of it; and modest collections of pictures and other works began to be brought together, under the auspices of the Government, in different parts of the kingdom, for the public benefit. The advantage of affiliating these scattered museums to a central administration, under whose direction exchanges and loans could be made from one to the other, was soon evident, and the plan of the National Museum of Science and Art was formed. Land was secured at South Kensington, then a rural suburb of London, and buildings erected, at first on a rather unpretending scale. The British public is, however, rich, and generous when it can see that it is doing good with its money, and the buildings were rapidly extended to contain the avalanche of scientific and artistic treasures which poured in, by private gift or by purchase with the money which Parliament, on the public demand, liberally appropriated.

PERHAPS only those who were in England twenty-five or thirty years ago can fully appreciate the fever of enthusiasm of which the new museum was the centre. The beautiful building in which the collections first found a worthy resting-place, itself a masterpiece of scientific experiment, as well as a monument to the artistic talent of its designer, Lieutenant-General Scott, must have done much to encourage rational freedom in artistic methods, and Sir Philip Cunliffe-Owen, who was placed, as Director, at the head of the administration of the Museum, was untiring in his devices for disseminating the advantages to be derived from it. Regular courses of instruction in the arts and sciences were organized; teachers were trained at South Kensington, and, when qualified, were sent out, under what had now become the Department of Science and Art, to teach in the principal provincial towns what they had learned. A system of loaning the Museum property to the provincial towns was organized, and annual exhibitions were held in London of the best work from the subsidiary schools, and valuable prizes awarded. Besides this, hand-books to the different departments of the Museum were prepared, so as to give as much information as possible on the general subject to which they related, using the Museum collections as illustrations; and text-books, for use in the lecture-courses, some of which are, even now, among the best works of the kind that we possess. In perfecting this vast system, Sir Philip Cunliffe-Owen was the principal agent. Undoubtedly, he was at first assisted by the advice of Prince Albert, one of the truest and most enlightened advisers who ever lived, and, after the death of that great man, the Queen and her children continued the friendly and affectionate interest which had done so much to encourage the Director in his work. Notwithstanding the gibes with which those who liked talking about art better than practising it pursued Sir Philip, his plan proved extremely successful. It did not produce a copious crop of geniuses, for men of genius are rare in any generation; but it taught many thousands of the English people how to draw and paint and design more than tolerably well, and, what is even better, it taught them to judge of works of art intelligently, instead of being blinded by the critics. The result is to be seen in the immense advance in English taste during the last quarter-century. The æsthetic craze of fifteen or twenty years ago was perhaps a rather ludicrous manifestation of the delight with which the more sensitive part of the community found their souls awakened to the charms of form and color, but it was a symptom of a very salutary development, and it may be truly said that, during the twenty-five years of Sir Philip's administration of the South Kensington Museum, English taste and artistic capacity, from the laughing-stock of all the Continental nations, became a subject which even the French, who, although they are conscious of leading the world in art, are quick to recognize merit in others, treated habitually with respect, if not with admiration. It may be imagined that so remarkable an achievement did not pass unnoticed among civilized nations, and Sir Philip was honored with the highest distinctions from the Governments of F[illegible]e, Germany, Italy, Austria, Spain, Portugal, Belgium, S[illegible] Russia and Turkey, as well as from our own, which bestow[illegible] him one of the three medals struck for presentation to [illegible]ersons who had been of the greatest service in organizing the Philadelphia Exhibition of 1876.

THOSE of our readers who do not find the American climate cool enough in winter, may like to combine physical gratification with intellectual improvement by taking part in the Congress of Architects which is to be held in Moscow in December next. We do not learn the exact character of the subjects which will come before the Congress for discussion, but, for the entertainment of visitors, two exhibitions have been arranged, one of architectural drawings, models and other illustrations of professional work, and the other of materials of construction. These two exhibitions will remain open for a month, but the sessions of the Congress will occupy only seven days, beginning December 9. The affair is undertaken entirely by the Architectural Society of Moscow, which deserves the applause of the whole profession for its enterprise.

LA CONSTRUCTION MODERNE answers a question in regard to the responsibility of architects, which many of our readers will find interesting. A correspondent says that in a building erected under his direction last year, the mortar is found not to have become as hard as it should be. The rubble-stones of which the walls are built are not properly cemented together, and, if some of them are removed, the mortar between them falls into dust. He accounts for this state of things by saying that last summer was a very dry one, so that not a drop of rain fell during the construction of the walls, and he thinks that the mason, either through negligence, or for the sake of economy, neglected to wet the stones and bricks, so that they absorbed the water from the mortar. He says that the contract required that the work should be executed with materials of the first quality, and according to all the rules of the art, and wishes to know if the architect can be held responsible for the bad work, and if so, to what extent.

M. RAVON, for *La Construction Moderne*, replies that for the results of furnishing bad materials and workmanship, after he had agreed to furnish them of good quality, the contractor is alone responsible. The architect's responsibility can, under French law, be engaged only when he has himself been in fault, either by negligence or want of skill in carrying out the work entrusted to him. According to the French decisions, the limit of the architect's responsibility for his own faults is the amount of his commission, and nothing further can be recovered from him, but there is an article in the Code Civil which provides for the joint responsibility of the builder and the architect in certain cases, and this is interpreted by the French courts to mean that where the defects have been due partly to the fault of the builder, and partly to that of the architect, the latter may be obliged to pay the builder's share of the damages, as well as his own, in case the builder should be insolvent and unable to pay them himself. In the present instance, M. Ravon says that the contract and specifications having provided for suitable workmanship, the architect could only be held responsible, either on his own account or *solidairement* with the builder, if he had given bad directions, or had been negligent or unskilful in supervision; and, if it were possible to commit the faults in question, notwithstanding such supervision as skilful and intelligent architects are accustomed to give, and it could be shown that the architect gave such supervision, but that the contractor profited by his absence to do bad work, which ordinary supervision would not afterwards detect, the architect's responsibility would not be in any degree engaged. Most practitioners would say at once that with lime-mortar, which is almost always used in France, the wetting of the bricks and stones would so rarely be necessary that the architect could not reasonably be expected to have it on his mind, and, in fact, we should say that the circumstances pointed much more directly to the contractor having made his mortar with bad or air-slaked lime than to any such extraordinary dryness of the other materials as would prevent the proper hardening of the mortar. Even in this case, however, it would be impossible for the architect to see the quality of more than a small part of the lime used for making the mortar, if the contractor tried to conceal it from him, and it would be difficult to detect air-slaked lime in masses of rubble masonry laid with lime mortar, until several weeks, or months, had passed by, and the work had begun to dry.

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THE FRENCH RENAISSANCE.[1] — VI.

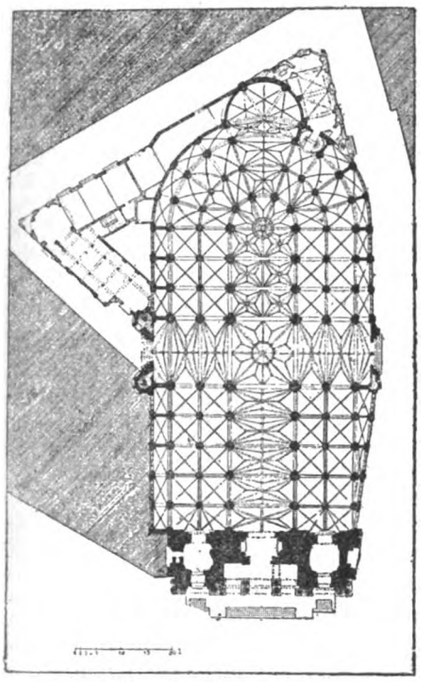


Fig. 22. Saint-Eustache, Paris.

FURNITURE aside, the French Renaissance counts three classes of productions: religious monuments, civil structures designed as gathering places or dwellings, and works of art which, whether forming an integral part of an edifice or not, may be logically separated from it. Military architecture, pure and simple, apart from a few gates — like the Porte Chapelle at Compiègne, Porte Montre-Écu at Amiens and Porte Notre-Dame at Cambrai — and street architecture, such as bridges, lay claim only remotely, if at all, to the Renaissance title.

We will close this study with a brief notice of each of the categories mentioned above.

The churches were the monuments that had least to gain with the Renaissance and those with which the Renaissance made the least progress. Notwithstanding the looseness of ecclesiastical customs, stubborn opposition was made to any concessions by the French liturgy, and possibly the architect of Saint-Eustache, at Paris, deliberately set out to prove to his contemporaries that such concessions were not absolutely indispensable. With clustered columns and pilasters, with Ionic and Corinthian orders reduced to the most charming proportions and modules and invested with the most unwonted functions, and with arches depressed in height or breadth, he realized, without any sacrifices, the sections and elevations of Notre-Dame of Amiens and of the basilica of Saint-Denis on the ground-plan of Notre-Dame of Paris (Figs. 22 and 23). Such daring conceptions, though variously estimated by good judges, cannot fail to attract one both to the edifice and to its creator. This is the only large French church in the Renaissance style that was built at a single effort; but the façade and towers are still lacking; the designs, however, are in existence. We encounter also similar tendencies, though less marked and less logical, in the more or less important fragments of religious structures erected at the same period. The façade of Saint-Michael at Dijon, the only one completed, might in this respect be compared to Saint-Eustache. The choir with a deambulatory and radiating chapels and the windows pierced beneath lofty vaults, elements that had contributed powerfully to the creation of Gothic architecture and that still gave it great authority, have never been abandoned in Paris, as Saint-Sulpice shows; these elements retained down to the close of the sixteenth century, and in some cases even later, the ribbed system, and, ribbing set aside, the more or less ill-shaped flying buttress. Notwithstanding the concessions granted the Renaissance in the distribution of exterior decorations, everything was not turned over to it unreservedly. The Greco-Roman door, poor in composition, could not prevail at the very first over the rich Gothic portal; the characteristic dispositions of the latter — jambs with colonnettes or statues, archivolts with manifold covings adorned with statuettes — were long maintained. Brittany engrafted on mediæval traditions a type of porches with huge statues of the apostles. The spandrels of the windows followed either Flamboyant contours, somewhat less complicated than in the past, or angular outlines inspired more or less distinctly by ancient types. The rose-window, with more or less cleverly designed tracery, still occupied the centre of the façade. The towers were erected at the same points, with the same distribution of stories and bays, and often, particularly in Brittany and Normandy, with the same spires as in the past; the lantern-tower of St. Pierre at Coutances, in Normandy, evidently emanated from the celebrated central tower of the neighboring cathedral. In the balustrades, Gothic designs were abandoned, but the most varied patterns of open-work were admitted, among which should be noted the colossal letters forming pious invocations, as at Caudebec and La Ferté-Bernard, which belong to the Norman School, and in Notre-Dame at Hâvre. This disposition seems to have been a triumph of the Norman genius, as well as the vaulting with flat soffits on ribbing, the most striking application of which, if not the most suitable for a church, is found at Tillières; the sculptures with which the panels are lavishly adorned are very far from being conducive to devotion.

At the top of the bell-towers cupolas were very successfully used, accompanied by decorative flying-buttresses and turrets, and varied by mouldings, carved in crockets or festoons along the arrises; a few judicious applications of the Doric frieze were also made in the time of Henri II.

The sepulchral chapels are likewise worthy of attention; they are generally circular in form and are always successfully decorated.

Among civil monuments we include palaces and castles, public buildings, such as court-houses and town-halls, and private mansions and dwellings. The castle had ceased to belong to military architecture, of which it maintained only certain chosen features; it went over wholly to civil architecture, or rather seized possession of it and directed its developments.

The lords, who were eager to maintain the prestige of bygone military power — and who were soon to have an opportunity in the religious wars to prove that this power was not wholly Platonic — were very careful at first not to alter the external appearance of their dwellings; occasionally, moreover, the fortification wall was constructed from foundation-stone to crowning, and sometimes the huge round towers, with their battlements and machicolations, were faithfully reproduced. Usually, the outline, if not the wall, was respected, which accounts for the incoherency and lack of symmetry in the courts and buildings. The king was not obliged to trouble himself about survivals, and, therefore, did not hesitate to replace the towers with square pavilions, or to endeavor, so

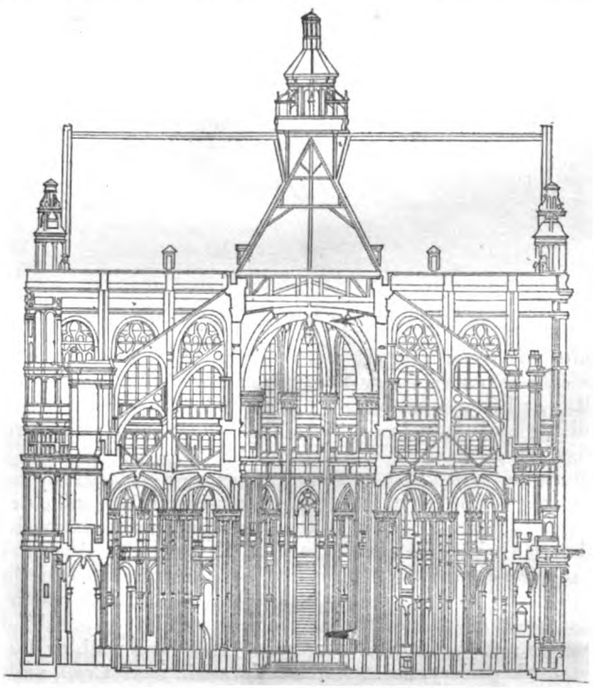


Fig. 23. Saint-Eustache, Paris.

far as the tastes of the time would permit, to secure the charms of symmetry and the appliances of comfort for his residence. This was a step toward the modern palace.

A few barons, in the latter part of the reign of François I,

[1] From the French of Anthyme Saint-Paul, in Planat's *Encyclopédie de l'Architecture et de la Construction.* Continued from No. 952, page 137.

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ventured to follow the example of the king in the castles to which their chief nobiliary title was attached: for example, the Constable of Montmorency at Écouen. Chambord, which seems to have been designed to combine all the eccentricities of the Renaissance rather than to form a pleasant dwelling, possesses enormous round towers that are without utility and without significance; François I suppressed them everywhere else, as, for better reasons still, did Henri II at Anet, Charles IX at Chambord and Catherine at Monceaux and the Tuileries. Where towers exist, that is to say in the majority of cases, each encloses, as in the past, a spiral staircase; the main staircase is often simply a spiral staircase of larger dimensions in a turret-shaped, circular or polygonal cage. Some of these constructions are marvellous works: famous examples are to be seen at Blois, La Rochefoucauld and above all at Chambord. The chapel of a château, in accordance with a custom two centuries old, was usually so situated that the semi-circumference of one of the towers served as an apse; it was, therefore, indicated on the outside and was recognizable by the windows which were similar to those of a church. The

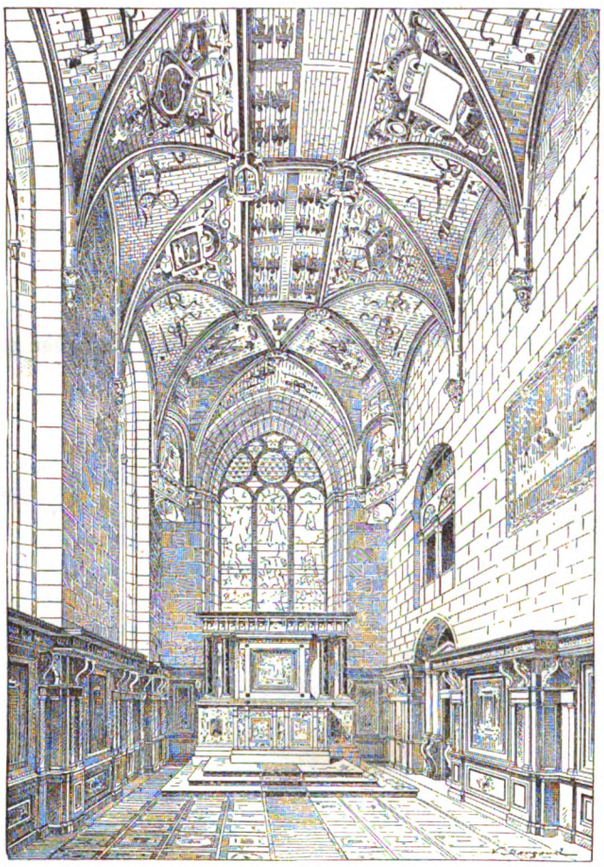


Fig. 24. Chapel of the Château d'Ecouen.

vaults of these chapels were either Pointed, as was still the case in churches, or they resembled those covering large halls; at Écouen, we have a sort of transition between ribbed-vaulting and barrel-vaulting with covings and penetrations (Figs. 24, 25).

A rectangular fore-part or a square tower enclosed the main entrance, which for a long time yet retained its double drawbridge. Under François I, the small entrance reserved for pedestrians had its counterpart on the opposite side of the great *porte cochère*, so that, as a whole, the entrance sometimes recalled the ancient triumphal arches with three openings. This front of the castle was often without any habitable structure; the latter was simply replaced by a wall, or by an open-work gallery, as at Sarcus, Verneuil, near Creil, and at the Tuileries as conceived by Philibert Delorme.

The vaulting of civil monuments rapidly fell away from Gothic methods, approaching more and more nearly the Italian, as at Fontainebleau, or the ancient methods. The semicircular or *anse de panier* barrel-vault, adorned with panels and caissons, acquired the predominance. At Saint-Germain, as an exception, we find vaults with ogival intersections; they were doubtless designed to support terraces and they are themselves, owing to a flagrant defect in the buttresses, supported in the Italian fashion by iron tie-beams.

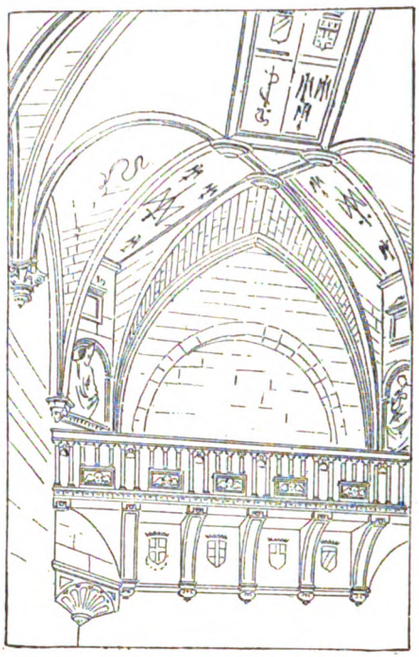


Fig. 25. Vaulting and Gallery of the Chapel of the Château d'Ecouen.

Town-halls and private mansions are, aside from the towers, diminutives of castles; symmetry is generally wanting in them, though this was not true of the Paris Hôtel de Ville — reproduced in the central portion of the present structure — which was perfect in this respect.

The *bourgeois* houses, with their narrow façades, are little else than a more or less happy combination of details. These may be studied especially at Orléans, Blois, Troyes, Dijon, Bourges, Rouen, Caen, Saint-Malo, Morlaix, Fontenay-le-Comte and in a few other cities. At Blois, Orléans, Dijon and Fontenay, they are largely of stone; elsewhere wood predominates.

The third class of French Renaissance monuments includes productions of wonderful variety: altars, tabernacles, altar-screens, stalls, rood-lofts, enclosures, baptismal fonts, pulpits,

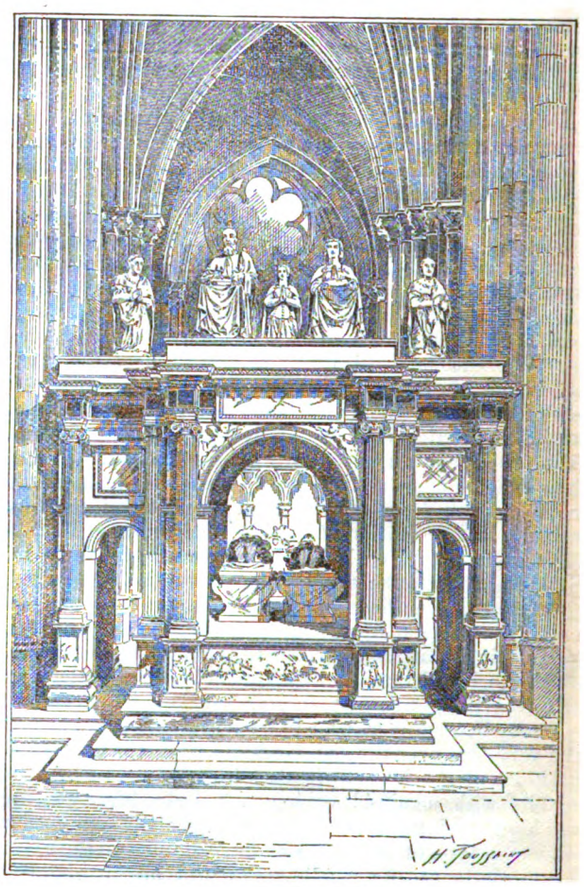


Fig. 26. Tomb of François I, Saint-Denis.

holy sepulchres, reliquaries, tombs, Breton calvaries and ossuaries, stone crosses, fireplaces, wells, fountains, etc.; the manner of treating them is equally varied. Were we to

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attempt to describe them here, we should be compelled to reproduce the articles devoted to each separate subject throughout the encyclopædia. We cannot, however, refrain from asking the student to note especially the tombs of Louis XII, François I (Fig. 26) and Henri II at Saint-Denis, of the cardinals of Amboise, at Rouen, and of François II of Brittany, at Nantes; they belong to a type in which the French Renaissance has at no time found a rival.

ANTHYME SAINT-PAUL.

ELECTRICAL SCIENCE FOR ARCHITECTS.[1] — IV.

OHM'S LAW.— THE BASIS OF WIRE CALCULATION.

THE prediction of results in electric circuits and the laying-out of systems of distribution are greatly facilitated by the simplicity of the law controlling the relation of the different quantities. To quote an expression of this law: it "is a special statement of the results of ordinary observation and it may be generalized thus: a result is equal to the effort put forth, divided by the opposing resistance or opposition." This general law is easily applied to electric circuits because of the independence of the factors. The law applies to water flowing in pipes, but upon attempting calculations, one at once sees the complicated nature of the resistance. It depends not only upon the size of pipe, but upon the number and sharpness of the bends, and even upon the velocity of the water itself, so that what promised to be a simple determination, becomes an involved mess of dependent factors. With electricity, however, except under special conditions, the velocity may be considered as always the same and does not affect the resistance, (the bends in the circuit make no difference), and we have to deal with only the three factors, effort, resistance and result, in their simplest form.

This one law, called "Ohm's law," is so widely applicable in engineering work, and is the basis of so much of the calculation, that its expression in the form of an equation is the symbol chosen as most appropriate for the membership badge of the American Institute of Electrical Engineers. The electro-motive force is the effort and is usually represented by E. The resistance is the opposition to this effort and is represented by R. The current is the result and is represented by C. Thus the general law, "a result is equal to the effort put forth, divided by the opposing resistance or opposition," when applied to electric circuits takes the simple form $\left(C=\frac{E}{R}\right)$. It is of course necessary to know only two of these qualities to determine the third.

Supposing there is to be a current of ten ampères in a circuit that is known to have a resistance of two ohms. The substitution in the formula shows at once that the electro-motive force or pressure necessary to give this result is twenty volts $\left(10=\frac{E}{2}\right)$. Or, there may be an electro-motive force of ten volts, and the circuit may be composed of a coil of copper wire .135 inch in diameter and 2,000 feet long. Copper wire of this size and length is known to have a resistance of 2.03 ohms, so that with ten volts' pressure and with the 2.03 ohms' resistance there will be a current of about five ampères $\left(C=\frac{10}{2.03}\right)$. With the aid of this law, circuits and parts of circuits may be examined, and losses or results determined with exactness.

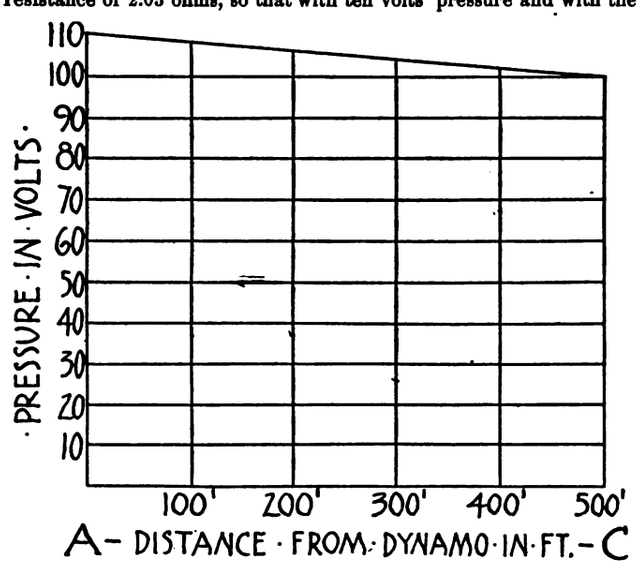


Illustration of the Loss of Pressure in Electric Circuits.

[1] Continued from No. 951, page 127.

In the illustrations given, the complete circuits were taken, but it is applicable also to any part, if the resistance of this part and the portion of the electro-motive force used in overcoming this resistance be taken alone in the formula.

The "drop" in pressure may be shown graphically, as in the diagram which illustrates the loss of pressure between wires leading to incandescent lamps.

Suppose the dynamo or other source of electricity is at A, and that the pressure at that point is 110 volts. Suppose that at C, 500 feet away, there is a cluster of 20 lamps, each requiring one-half ampère to make it burn at the proper candle-power. Then there should be a total of 10 ampères flowing in the circuit. If the lamps were at A, attached directly to the dynamo, they would of course have the benefit of the full pressure, and the whole resistance of the outside circuit would be only the resistance of the lamps. But if they are 500 feet away from the dynamo, leading-wires will have to be used; these will have a certain amount of resistance, and a certain amount of electro-motive force will have to be used up in overcoming this. Let it be assumed that No. 10 copper wire is used to connect the lamps to the dynamos. 500 feet of this wire will have a resistance of almost exactly one-half ohm. The wire runs to the lamps and back again, however, so the resistance of the wire part of the circuit will be one ohm. It will be necessary then, to force 10 ampères through this one ohm resistance as well as through the lamps. The amount of electro-motive force that it will take to force 10 ampères through one ohm resistance can be seen at once by substituting in the formula,

$$C=\frac{E}{R},\ 10=\frac{E}{1},\ E=10 \text{ volts.}$$

Ten volts then will be used up in the wires, and since there is but 110 volts' pressure at the dynamo, there will be left only 100 volts for forcing the current through the lamps to produce light.

By letting A-C in the figure represent the distance between the lamps and dynamo, and the perpendicular lines the amount of pressure at different points, it can be seen how the pressure falls along the line. If the lamps are made to burn properly at 110 volts' pressure only, the wire must be 10 times as large in sectional area or else the dynamo must be made to give 120 volts, so that there will still be 110 volts left at the lamps after the resistance of the line has caused a loss of 10. But the effect of raising the pressure at the dynamo can be seen by imagining all but one of the lamps turned off. There will now only be one-half ampère flowing and only one-half volt will be used up in forcing this against the resistance of the wire $\left(\frac{1}{2}=\frac{E}{1}\right)$. This will leave 119.5 volts at the lamp, which is such an excess over the voltage for which it was made, that it would soon be destroyed. If, on the other hand, the wire is made ten times the sectional area, it will have only one-tenth the resistance or .1 ohm. When all the lamps are on, the pressure lost in the wire will be one volt $\left(10=\frac{E}{.1}\right)$, and if the pressure at the dynamo is 110 volts, there will still be 109 volts left for useful effect at the lamps. When one lamp is on, the pressure lost in the wire will be .05 volt $\left(\frac{1}{2}=\frac{E}{.1}\right)$, and there will be 109.95 volts at the lamp. Thus, if the resistance of the wires leading to the lamps is kept as low as .1 ohm, either one lamp or twenty may be turned on and there will not be a difference in the pressure of more than .9 volt, an amount so small that no change in the strength of the light could be detected by the eye. Even at the dynamo or at any intermediate point, a lamp would have practically the same pressure.

It can be seen from the examination of this case how necessary it is to satisfactory service, that there be equality of pressure at all lamps at all times. The calculations are often somewhat complicated by the number of branches and the positions of the lamps, and experience assists one to see quickly what will probably be the best arrangement, but the loss may always be found by an application of Ohm's law, and even with experience one must in the end rely upon this to ascertain the exact sizes of wire.

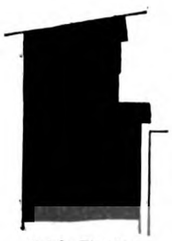
The first cost of a plant and the cost of maintenance may in several ways be affected by the method of proportioning the wires. The wires may be so small that a large part of the energy delivered by the dynamo is wasted in worse than useless heat, as has been shown. The conductors may, however, be of sufficient size to prevent excessive loss and to keep the pressure constant at the lamps, and yet be arranged so that a much larger amount of copper is used than is necessary. Since the length of the wire, as well as the sectional area, makes a difference in the resistance, there is need of judgment in placing the main wires, in choosing "centres of distribution," and in dividing the circuit into the different branches. There should always be equality of pressure at the lamps for another reason that is not commonly considered. All lamps are not made of the same "efficiency." That is, for a light of sixteen candle-power, some will require more energy than others — more coal will be burned under the boilers. The most efficient lamps require an almost constant pressure of the amount for which they are designed. If the pressure rises more than a small amount above this, the lamps have a "short life," and it is only in plants where the regulation at the dynamo is of the best, and where the wiring is

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calculated for a very small loss, that they can be used. If the wires are so small that turning off a number of the lamps causes the pressure at those remaining to increase several volts, the more efficient lamps cannot be used on account of the expense of renewals, and it is necessary to use those that will not be too much affected by the variation. Such lamps can be had and are widely used, because there has been much poor engineering and the breakage must be kept small. Their use is, however, made necessary only by the variation of the pressure, and they are a constant expense because of the greater cost of operating them. RUSSELL ROBB.

[To be continued.]

THEATRES. — I.



Daly's Theatre.

SHORTLY after the conclusion of my last series of articles upon "Theatre Regulations" in this journal, the editors asked me to prepare for them further papers upon the architecture and descriptive history of the various important theatres at home and abroad. I have been some time collecting the material, but am now ready to lay before the readers of the *American Architect* the result of my labors.

It is a matter to be regretted that it has not been found possible to recast in a common form and reduce to a uniform style of treatment and rendering all the illustrations that will be used with this series. But, in spite of this defect, it is hoped that these papers will go far toward supplying the demand so frequently expressed by architects, both American and English, for plans and data concerning really notable play-houses.

As the two series of papers on "Theatrical Architecture" and "Theatre Regulations" have been so recently published in this journal, it is supposed that readers of the present series can easily bear in mind the explanations and recommendations therein made and, hence, that it will not be necessary here to waste time and space in retracing the steps so lately taken.

Before beginning so important a task, it would be well, perhaps, to plan out some definite lines upon which to work, and to confide in my readers as to this, so that we may start with mutual understanding.

The object of these papers is this — to make a collection of theatre plans of all countries, to obtain elevations, sketches and constructional details, to illustrate any particular or peculiar feature in the design, construction, or planning, and at the same time to compare, as far as possible, the sizes of the various theatres illustrated. In this comparison of sizes my greatest difficulty has arisen. The architects who have placed their drawings at my disposal have not, of course, all made their drawings to one scale: English plans are drawn to different proportions of a foot; Continental plans to the metre. In order, however, not to lose all idea of proportionate sizes, I propose to give a block plan in most of the cases, which block plan shall always be to the same scale, and, where possible, I shall also produce the general plans and drawings with a scale upon them.

It is usual when concluding a lecture or paper to acknowledge any help the author has obtained, and I wish to reverse the order of things, and at the outset thank all those architects who have so kindly laid their drawings at my disposal, for the benefit of the readers of the *American Architect*. The gentlemen to whom I have appealed have one and all granted me permission to make selections from their drawings for reproduction in this journal. Without their aid these papers could not have been written; their names will be given with their work as it is illustrated. I have also to acknowledge and to sincerely thank Mr. Edwin O. Sachs for the valuable assistance he has afforded me in procuring plans of Continental theatres.

I have not chosen for my first chapter a theatre of great magnitude or one with any extraordinary feature, but I have selected a very good type of a moderate-sized London playhouse, the proprietor of which is the noted American manager, Mr. Augustine Daly. In selecting "Daly's Theatre" I acknowledge that I have been mindful that I am an Englishman and am writing for my American professional brethren, and I am, therefore, more than pleased that we are able to start together upon common ground, in considering the plans of a London theatre run by an American of such note as Mr. Daly.

The origin of the playhouse in Cranbourne Street was undoubtedly the great success that Mr. Daly's Company had scored during their various visits to the Gaiety Theatre, London. The idea of an American theatre in London was thereby created in Mr. Daly's mind, and at the conclusion of one of their visits, Miss Ada Rehan laid the foundation stone of this house, which was christened by our famous *comedienne*, Mrs. Bancroft.

I am indebted for the complete set of plans, sections and elevation which are here produced, to the kindness and courtesy of the architect, the late Mr. Spencer Chadwick, whose recent death has been deeply lamented by his professional friends. To Mr. P. G. Pilditch, his partner and successor, I am also indebted for much information and help.

This theatre, as far as the planning goes, may be looked upon as a very fair example of the average London theatre, where comedy fills the bill. It was not built for opera, it was not built for spectacle, it was built for Mr. Daly's Comedy Company, and this my readers must remember when examining the plans. The success of the house as a convenient and comfortable theatre has been acknowledged on all hands; there are no complaints here of seats, from which the action of the play cannot be seen, and the audience is endowed with a sense of security and safety on account of the well arranged and numerous exits.

The section will show that part of this theatre is below the street level, and that the dress-circle is at that level, being entered from Cranbourne street through a vestibule and hall; the stalls are approached by staircases leading from either side of this hall. The pit is below the street level. This excavating for the theatre is done in order to equalize the distances to be travelled by the public from their seats to the street, and sinking the pit allows the gallery to be so much nearer the pavement-level.



Daly's Theatre, London. Spencer Chadwick, Architect.

It will be noticed that the house consists of pit and stalls on the basement level, dress-circle and private-boxes on the ground-floor level, upper-circle and private-boxes on the first-floor level, and gallery on the top floor. Each of these divisions of the audience is provided with two separate exits, one of which is of course the entrance, and these are very clearly marked and numbered on the plans. The arrangement of the various divisions of the audience is one that is usually to be found in a London theatre of this character.

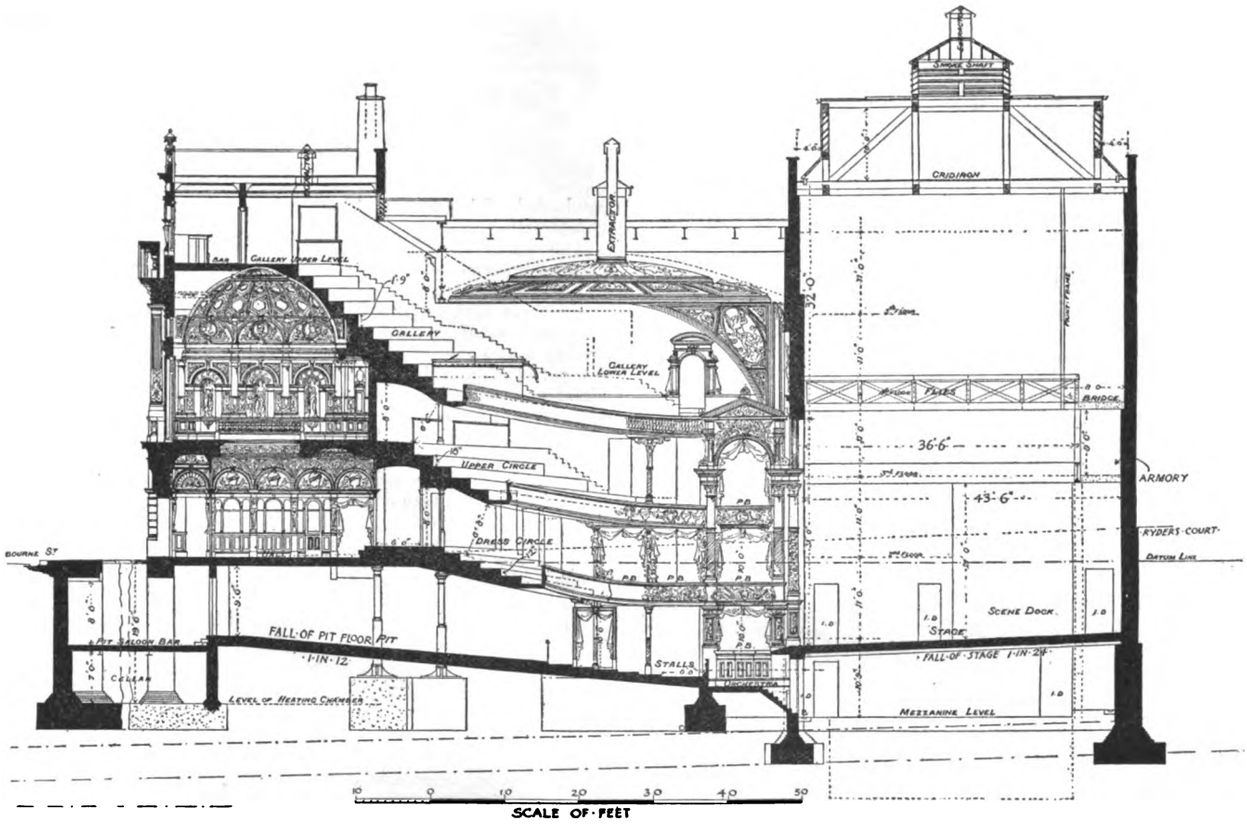
The width between the main walls is just sixty feet, and the distance from the front line of the dress-circle to the curtain line is 34′ 6″, upper-circle front to curtain 39′ 0″, gallery front to curtain 45′ 0″, the tiers receding back one from the other as shown on the section. The full depth of the house from curtain line to the back wall of the pit is 79′ 0″.

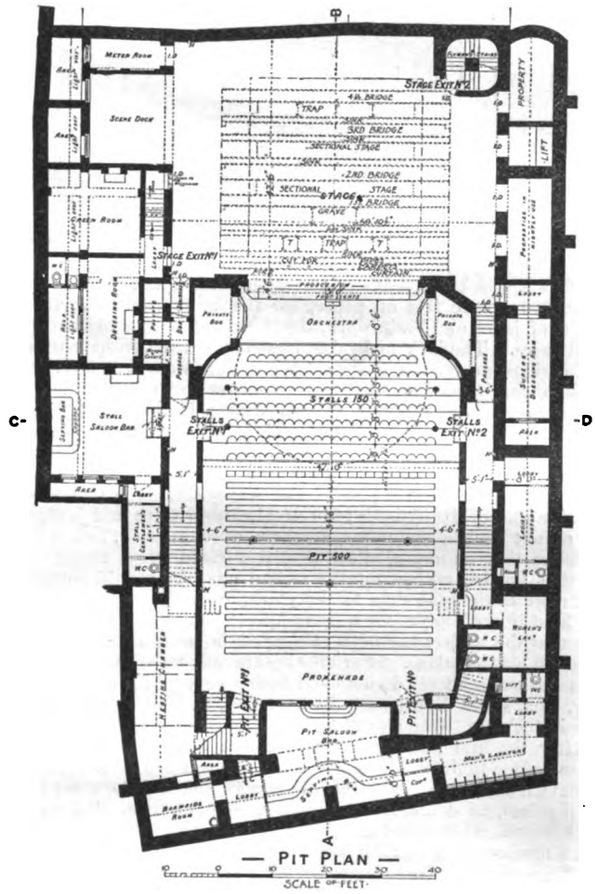
The construction of the auditorium is fire-resisting throughout, all the staircases being of solid concrete steps and landings, the corridors of concrete and the tiers of concrete on steel cantilevers. There are no columns obstructing the view of the spectators. When describing another London theatre, I may have

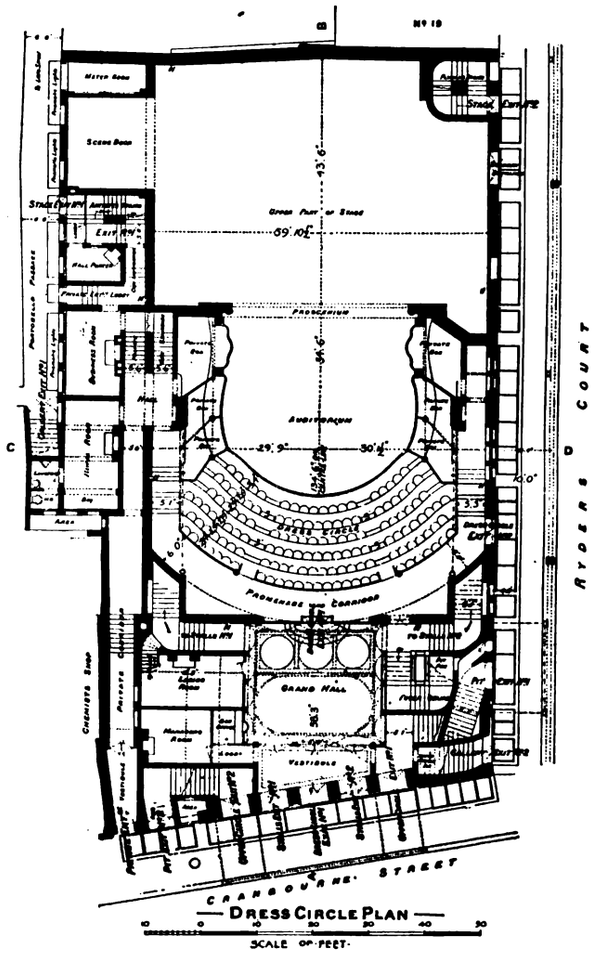
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more to say on the cantilever system of construction. The application of this system presents certain difficulties which the adoption of the column system frees the architect from, but the result obtained is so much more satisfactory to the audience, that we may expect architects to grapple with the difficulties referred to, which in a professional paper I need not particularize, and to adopt cantilevers more frequently than in the past.

The numbers seated in the various parts are approximately as follows: pit 500, stalls 150, dress-circle 140, upper circle 161, gallery 500, making a total, with private boxes, of about 1,500 persons.





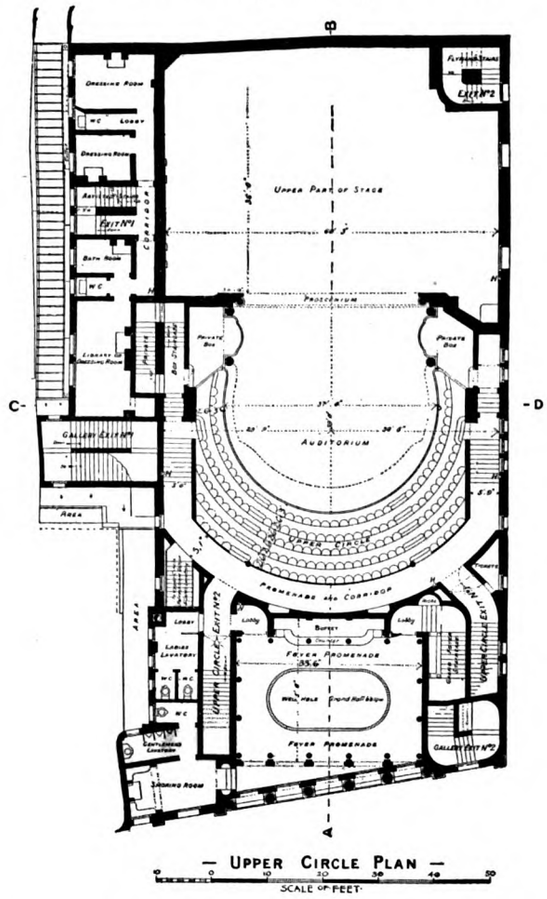


The decorative of this house is not quite as happy as it might be, being carried out in unrelieved masses of lacquered gold and silver; the architects, however, it is understood, were not responsible for

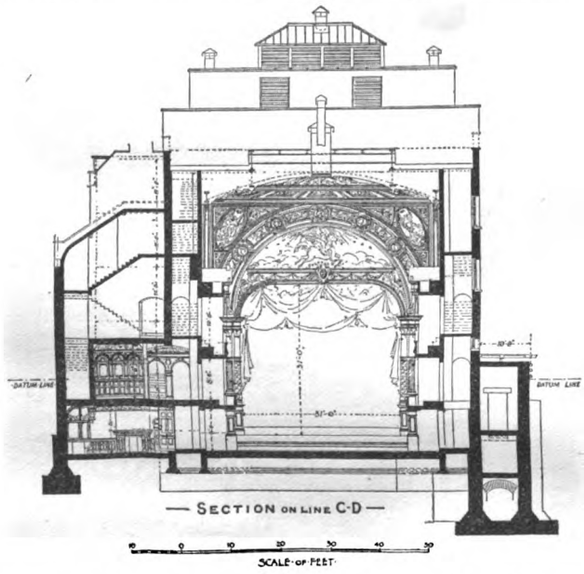
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this. The decorative idea originally sketched out and approved by them was much lighter in treatment.

So much for the auditorium — now let us glance at the stage, the chief feature of which is its height. The gridiron over the stage



has been placed at a height equal to twice the height of the proscenium-opening, thus allowing the scenes to be taken up without folding, saving wear and tear of the scenes and risks from fire. The stage is 60′ 0″ wide by 42′ 6″ deep, with a proscenium-opening 31′ 0″ in width. The dressing-rooms are conveniently situated at the side of the stage with separate entrance and staircase, and entirely cut off from the stage as a distinct fire-risk. The lighting throughout the house is by electricity, with a subsidiary system of gas to be ready on emergency. There is a very ample supply of hydrants for fire protection, which can be traced on the plans at points marked *H*.



There is a fireproof curtain dividing the stage from the auditorium, and over the stage is a large ventilator or smoke extractor to draw the smoke away from the auditorium, should at any time a fire occur on the stage.

(To be continued.)



Cincinnati

The Competition for the New University Buildings of Cincinnati.

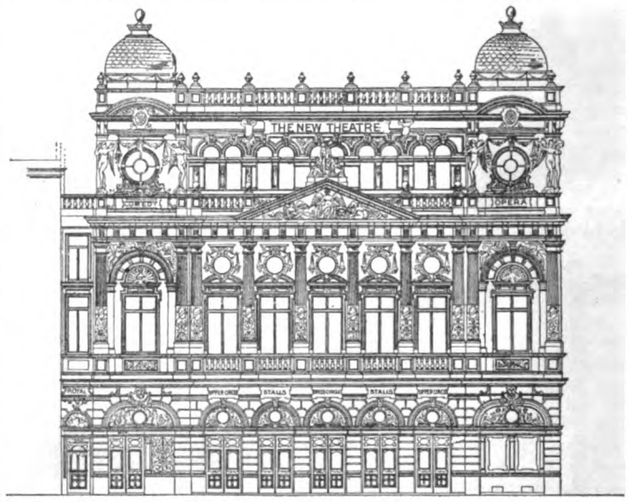
The competition for the New University buildings, recently decided in favor of Messrs. Samuel Hannaford & Sons, seems to have been a well conducted affair as competitions go, and a short review may not be uninteresting.

The conditions were copied from the New York City-hall competition programme, but they were not quite so elaborate.

There were three prizes offered, $500, $300, and $200 respectively, to the three designs judged most meritorious. The only difference from the usual method of making such awards being that the architect who got the $500-prize also got the job at the usual rate of five per cent upon the cost, whereas all architects who go into these phantom-chasing expeditions well know that the $500 should go to some competitor not fortunate enough to get the execution of the work at the usual rate; the committee, however (from lack of good architectural advice, no doubt), thought otherwise, and so heaped riches and honors upon the head of the successful aspirant.

The committee, who considered themselves competent to judge in matters architectural, were selected from among our best citizens, judges, doctors, merchants and professors, men above reproach, so that we can heartily say that the competition was conducted with perfect fairness, and if any errors were made they were of the head and not of the heart.

The profession must have felt that they were in good and safe hands, or else there would not have been so liberal a response to the



call. As it was, twenty-six architects responded, and each submitted about 200 square feet of paper, for the most part covered with results of labor and brain work, the latter not of the highest grade in all cases. The lack of brains, however, showed in only three or four designs, as, for the most part, the designs were very meritorious.

There can be no doubt but the committee arrived at a just conclusion in awarding the first place to Messrs. Hannaford & Sons, at least, so far as the plan is concerned, as it is simple, well studied, and as the different rooms, halls, stairs, etc., are all placed in their proper places; well disposed, well lighted, and well arranged, it is without question the best plan of the twenty-six. We wish as much could be said of the exterior; but architectural truth and justice will not permit such a statement, as there were, at least, half a dozen exteriors that an unprejudiced architect would place ahead of the one that the committee put the ribbon on. As a rule, committees look more to the plan than to the elevation, and in competitions of this kind if the competitor will lay himself out on his plans and feel sure that the subject has been exhausted, he need not be so particular about his elevations. After all, *they* are only to be judged by architects and as architects do not build houses (except for other people), why, what's the difference? So, hereafter, O, Ye Competitors, take care of the plan — the elevations will take care of themselves.

After the first place was awarded, the committee awarded the second place to J. W. McLaughlin and the third to Mr. S. S. Godley, so that Cincinnati carried off all the honors, and had there been a few more prizes, no doubt she would have secured them also, as there were several other Cincinnati architects in the list of competitors, and a man on the ground is worth two in New York or elsewhere, for the reason that he has a better chance of ascertaining the needs of such a building, and can interview the faculty; this fact accounts for the fact that outsiders, for the most part, put their main lecture-hall (about 50′ x 70′) on the second or even the third floor, which

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while not exactly contrary to instructions, yet was not what the building needed, and it is strange that even several of the Cincinnati architects fell into this same error. The committee, no doubt, thought architects should know as much as they (the committee) about the building, or else the said instructions would have contained another line stating that the hall, containing 36,000 square feet or thereabouts, must be on the ground floor.

The instructions stated that the main building was to cost about $100,000 and the wings about $75,000; it may be that this sum will do the work, provided all decorative work, approaches, etc., are left to be considered as outside the pale of the building proper. Messrs. Hannaford's plans will come as near the mark in this regard as any of the designs submitted; however, several manifestly would go far beyond the limit of cost, and, therefore, no matter how meritorious they might otherwise be, this one thing would militate against them.

There were eight designs that were Gothic (some more so than others), four Romanesque, so-called, and eight Classic or bordering thereon, and the rest it would be hard to name, except one design, the authors of which were bold enough to strike out into the hitherto untrodden path of the Persians and made a blind stagger at some temple or another at Persepolis. This was, we are glad to say, the only real freak in the exhibition.

The following is the list of architects who were attracted by the light, in the hope of getting a rather good job at five per cent:

1. Samuel Hannaford & Sons, Cincinnati: placed first. Drawings well rendered. Elevations bordering on Classic.

2. James W. McLaughlin, Cincinnati: awarded second place. Plan entirely different from those placed first and third, and that is what strikes a critic as being strange. Did not follow instructions in several particulars; outside, Romanesque, after McLaughlin. Two exterior designs, and one wondered why, as they were so near alike.

3. S. S. Godley, Cincinnati: placed third by the committee, where in our judgment it rightfully belonged. Rendering, very good. Exterior, free Classic and good. Violated instructions, in that the approaches were shown. Wings on different level from main building. Front colonnade, useless and very expensive.

4. Des Jardins & Hayward, Cincinnati: should have been placed second. Rendering, good; elevations, good, plain, clear-cut Classic. Plan nearer to first prize than any one in the room, except the one that "got there."

5. A. O. Elzner, Cincinnati: Perhaps the best showing of any so far as the mechanical part is concerned. Exterior, Romanesque. Large dome, evidently the result of the World's Fair, very expensive. The whole design shows much study but too much effort after the unattainable.

6. H. E. Siter, Cincinnati: Well prepared set. Romanesque, perhaps, but with enough English Gothic here and there to make it difficult to say just what it was. Hall on third story; plan otherwise good.

7. Raymond & Rabenstein, Cincinnati: Persian; beyond analysis or criticism.

8. Sweeney & Robinson of Cincinnati.

9. Paul C. Pape, Cincinnati.

10. F. E. Townsend, Hamilton, O: Gothic.

11. W. B. Bigelow, and H. D. Hooker, New York: Rendering, good. Gothic; whole thing good, but entirely too expensive. Plan well studied, but not on the right track.

12. John Lyman Faxon, Boston: Classic. Hall on third floor, expensive colonnade entire length of the main building, on the rear up to, but not connecting with, the wings. This was a stumper to the critical eye. Design and rendering not up to the average.

13. Glover & Carrel, Brooklyn, N. Y: Hall on third floor, plan not suited to purpose, too much waste room at entrance. Exterior, Classic, the best of its class in the exhibit, and barring the theatre-like low dome, the exterior was pleasing in the extreme.

14. Vivian & Gibb, Ithaca, N. Y: Gothic and very good, in fact the best Gothic design in the room; perhaps not just suited to the quiet dignity of a college building, but nevertheless good. Hall on the second floor; rendering, good.

15. Alfred H. Granger: Gothic, and would have been good except for having too much window. Gothic, like every other style, requires some wall-surface for dignity and repose; hall and library, top floor; rendering, good.

16. G. W. Bunting & Co., Indianapolis: Romanesque. Two immense vent-stacks on front, the most prominent feature of design, whereas such should have been very subdued.

17. W. S. Dutton, Cleveland, O.: Gothic. Design and rendering, good.

18. Chas. I. Williams, Dayton, O.: Classic. Design and rendering, fairly good. Plan not much studied, and rendering what the boys in the office would call "sloppy."

19. Wilson & Shuster, Pittsburgh, Pa.: Classic, with court-house dome. Plans, passable. Rendering, passable.

20. Samuel A. Ballard, Springfield, Ill.

21. Makepeace & Faber, Syracuse, N. Y: Hall on second floor. Good Gothic exterior. Rendering, passable.

22. Wesley Arnold, M. A., Clinton, Iowa: Romanesque, so-called.

23. W. E. Farra, McConnellsville, O.: Did not follow instructions. Rendering, passable. Plan and elevation, bad.

24. Jas. B. Nettleton & W. B. Stratter, Detroit: Gothic. Rendering, poor.

This affair teaches one that it is no use to go into a competition, unless he lays himself out for all he is worth — either let the thing alone, or give it the study and work it demands, for some one or more competitors are sure to do this, and then the poorly gotten-up plans look forlorn alongside of their more serious neighbors. These competitions come high, but it seems that we must have them: one of the competing architects said that their set cost them $150.00 good and lawful money of the United States. There were others that certainly cost more, and some that may have cost less, so that it would be within reason to say that $4,000 were spent in this competition, besides wear and tear of brains, and at least twenty-two persons getting their feelings hurt.

THE ARCHITECT AS LANDSCAPE PAINTER.



Second Prize Design for Monument to Doudart de Lagree.

EVERY season of the year has its recurring subjects, just as it has its returning flowers. As we expect Christmas roses, and Lent lilies — "fair maids of February," and daffodils that "take the winds of March with beauty," — so we look, a little later in the year, for the annual crop of reproaches addressed to architects who do not color or shade their own perspectives. "In the charming month of May, when the breezes fan the treeses, full of blossoms rich and gay," comes the annual lecture to those exhibitors in our art, whose "treeses" are not home-made. How improper of Mr. A to show in the Royal Academy a sketch of his last new house, with foliage and foreground put in by somebody else! How shocking of Mr. B to call himself the designer of a church, when he did not and could not draw the sky behind that very church-tower! And how contrary to every principle of rectitude for Messrs. C and D, and E and F to exhibit views which they did not even outline themselves! Why does not the Academy rise and expel such impostors?

In this way, every spring, a quantity of good indignation is wasted. What calls it forth? Nothing but the popular delusion that picture-making alone is art. It has been dinned into the ears of this generation that the literal rendering of natural facts is all that makes the artist what he is. So far as he is an exact transcriber of them he gets universal homage. The critics praise the truthfulness of his forms and colors, and the populace with gaping mouths crowd round a view which they can hardly distinguish from reality. If he stops there, it will be well with him. But perhaps unluckily, he may possess the power of invention as well as of imitation. Like great men in all ages, he may try, not only to copy, but to create. Then he soon finds himself in the wrong century. He is like a human being evolved before the time, in some far-off Simian age. If he is to live and flourish, he must suppress the man within him, and cultivate the monkey: he must act "as if his whole vocation were endless imitation." Now the architect, if he deserves the name, cannot act so. His business is essentially an inventive one. Here and there he may suggest some natural form, and he will aim everywhere to let his work harmonize with the world around it. But at its highest it is an extension of nature, and not a copy of it: the making of something never made before — and yet the making of it in the same spirit in which all the beauty of the earth has already been made.

This making of the new is a terrible shock to people who only ask for a copying of the old, and when they see the two things together in a picture — when they find, for instance, a drawing of some clever architectural composition represented with its natural surroundings — it is the surroundings, and not the architecture, which really interest them. The creative element they cannot appreciate: it is foolishness to them. So, leaving this, they turn to the grass and the shrubs, the sky and the hills, and ask if the architect of the building really drew these things himself. If he did, they think him an artist, better or worse; if he did not, they cannot understand what business his drawing has on the walls of the Royal Academy. In their most violent seizures — perhaps when the moon is at the full — they will even advise that no architectural views shall again be admitted there, except those which each architect has produced from first to last with his own hand.

One would think that everybody who has considered the question for a moment must see how, in the very nature of things, architecture must always be at an overwhelming disadvantage in an exhibition, apart from arbitrary rules like this. Just as a painter is a man who

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produces a painting, and not the mere sketch or wood-cut of a painting; just as a sculptor is a man who produces sculpture, and not mere studies in the flat for sculpture — so an architect is a man who produces architecture, and not mere views of architecture in one or more of its myriad aspects. Now the painter can exhibit his work easily. It is made in most cases, for the very purpose of being exhibited in a gallery of some sort or other; it is portable, and when it is hung on a wall, there, before the eyes of the spectators, is the very thing which the painter has produced. It is almost the same with the sculptor. What he does is less portable; but with rather more trouble than the painter, he, too, can set the very work he has made in the view of everybody who enters the exhibition. The architect is in quite a different case. His productions are not portable at all, and, if they were, no gallery ever yet opened would hold them. They are scattered over the country, or over many countries. The best of them, perhaps, are seen by few. To people in general they are only known by such faint reflections, in one or two of their aspects, as can be drawn and hung up or published. They may be full of excellence, inside and out; fresh points of view may bring out fresh beauties in them, and beauties which their maker carefully studied and provided for. They may have picturesqueness of grouping seen afar, and force combined with delicacy of detail in a nearer view; and yet of all their merits, such sketches as it is possible to exhibit cannot, perhaps, show one in a dozen. Is not architecture already handicapped enough by these unavoidable conditions? Cannot our imitation-mongers let it alone, and must they also try to add the artificial condition, that even the exhibition-views themselves of a building must be drawn by its architect?

It may happen that an architect has a turn for drawing from nature, just as he may chance to have a turn for chemistry, or chess-playing, or private theatricals. If he has, so much the better for him. He is likely to carry away popular applause, even from better men. He knows — what a landscape artist or even a painter of architecture rarely knows — under what lights his building looks best. He can bring out its strong points and slur over its weak ones, and make in this way an ideal view of it. This is reason enough why any architect with a gift for landscape painting will find it pays to cultivate the power he has. But it is not a reason why some still better architect with no gift for landscape should be made worse off in comparison than he already is. When he has produced his building, he has done his part. If that is bad, no cleverness in producing views of it will make it good. If he makes an attractive perspective of it, that may prove him to be an able sketcher, a good pen-and-ink draughtsman, or even a promising colorist. But it does not prove him to be a good architect, any more than his inability to shade or color views in an attractive way would prove him to be a bad one. The two faculties are totally distinct; and though some exceptions will suggest themselves, one might even say that the cultivation of either faculty generally tends to weaken the other. The architecture of painters and the paintings of architects are both things which the world can very well do without.

There is a tendency in these times to be for ever adding to the list of subjects which architects are expected to understand. They are to know a little about construction, and a little about design; a little about arches, a little about girders, a little about roofs; a little about iron, and a little about steel; a little about churches, and a little about baths and wash-houses; a little about Classic, a little about Gothic, and a little about Renaissance; a little about decoration and sculpture, and a little about sewers and grease-traps; a little about law, and a little about landscape painting. A thousand other things, which there is not space to enumerate, are thrust upon their attention perpetuately, and they are warned that to be ignorant of one is to be either a professional or an artistic failure. The architect, according to the cackle of the day, must be a Jack-of-all-trades. The inevitable result is that he will be a master of none. The wonderful complexity of modern life demands of him all sorts of capabilities. It leaves him no chance to know a few things, and to know them well. But it does not really demand of him that when he has produced a building, he and nobody else shall also produce the views of it. It does not really insist that he, with incomparably more varied duties than architect ever had before, and with incomparably more difficulties in the doing of them, shall leave his own art every now and then, and experiment a little in another art, which was by itself big enough to fill the life of a Gainsborough or a Turner. It does not really require him to do what the greatest architects of old neither did nor attempted. They put all their power and knowledge and invention into their buildings, and so left them. Having produced a work of architecture, they evidently thought their labors with regard to it were at an end; and they never dreamed that there was a glorious nineteenth century coming, which would hold them cheap unless they drew and shaded on paper a view of the building which they thought they had finished and done with. — *Building News.*

Excavations at Jerusalem to be made. — After long delay, a firman has been granted by the Sultan to the Palestine Exploration Fund to excavate for two years in Jerusalem. The work, so fruitful of results when carried on by Messrs. Wilson, Warren and others twenty-five years ago, will now be resumed under the charge of Mr. J. F. Bliss, who has done very successful work at Lachish. Prof. T. F. Wright, No. 42 Quincy Street, Cambridge, Mass., is secretary for the United States, and will give further information if applied to. — *N. Y. Tribune.*

Societies

The Sketch Club of New York.

The regular monthly meeting and dinner was held at the club-rooms, 1473 Broadway, Saturday evening, April 7. President E. A. Josselyn occupied the chair; fifty members and seven guests were present. Mr. W. G. Brown, chief designer of the Bigelow Carpet Company, was the guest of the Club. Mr. Brown entertained the Club for an hour with a very interesting and instructive talk on the history, manufacture and designing of carpets. He illustrated his lecture with pieces of carpet, designs and photographs of the machinery used in its manufacture.

A letter of criticism and award by Mr. John H. Duncan for the monthly competition was read by the Secretary. Mr. Clarence A. Fullerton received first place in the "Village Church and Parsonage" competition, Mr. Sieder receiving first place in the "Mausoleum" competition.

Treasurer Willard Hirsh, who is now with Mr. Shweinfurth in Cleveland, O., sent in his resignation, which was accepted with regrets. Mr. A. Schoenagel was elected to succeed Mr. Hirsh.

After the reading of committee reports and other minor business, the meeting adjourned at 11.15.

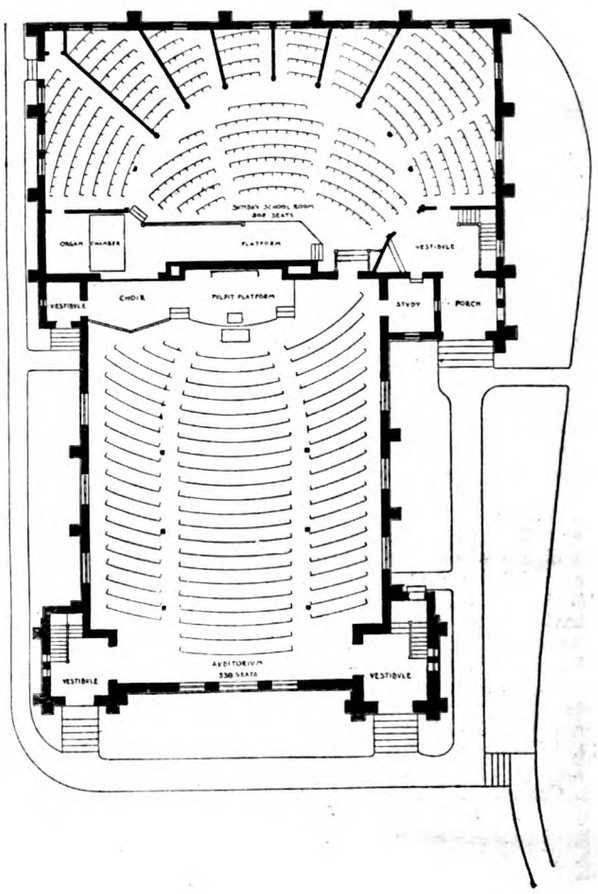
H. C. Pittman, *Recording Secretary.*

The Illustrations

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

First Presbyterian Church, East Cleveland, O. Mr. W. W. Sabin, Architect, Cleveland, O.

[Gelatine Print issued with the International and Imperial Editions only.]



The East Cleveland Presbyterian Church is the oldest organization of the Western Reserve. The first log church was built in 1810; replaced in 1816 by a frame building which, in turn, gave way in 1893 to the present structure of buff sandstone. The Sunday-school room only is finished at the present time and was dedicated Feb. 4, 1894. The building will cost when completed about $35,000.

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ST. MARY'S LUTHERAN CHURCH, SILVER RUN, MD. MR. J. A. DEMPWOLF, ARCHITECT, YORK, PA.

THIS church, now in course of erection, will be built of gray free-stone in broken range work, rock face, with all the trimmings tooled. The roofs are covered with blue Peach Bottom slate. The interior is finished in hardwood throughout, with panelled and ribbed ceiling, wainscoting and rough plaster tinted buff. The cost of the church, complete, is $13,000.

REJECTED DESIGN FOR THE FIRST CHURCH, PLYMOUTH, MASS. MR. J. E. CHANDLER, ARCHITECT, BOSTON, MASS.

THE site for which this design was intended is one of the most interesting which any New England town can offer. It is at the foot of the old Burial Hill, in Plymouth, Mass, and facing Town Square, which is the termination of Leyden Street — the first street laid out in New England — on which are several quaint old houses of modest Colonial type. The First Parish Church, still holding the original charter, has had three edifices, and is about to build another. The first was in, and formed a part of, the Old Fort erected in 1621 on Burial Hill, directly back of the site in question. Of the two succeeding church edifices, the first was Colonial — somewhat like the "Old Ship" in Hingham — and the second, recently burned, was a wooden Gothic structure.

If the most were made of this opportunity to secure a remarkably beautiful ending of Leyden Street and Town Square, the church would be built elsewhere, and the winding path leading to the crest of the hill could then be turned to the centre and head of the Square and entered by appropriate iron gates. A most interesting and charming view, distinctly New England in character — that of a steep, tree-crowned hill, thickly covered with old slate grave-stones, rising directly from the business portion of the town and framed by fine old elms in the foreground — would then be saved for the enjoyment of coming generations.

The plans published herewith were approved and advanced by the second building-committee, but were rejected by the parish.

PROPOSED CHURCH AND PARISH-HOUSE FOR THE GROVE HALL UNIVERSALIST SOCIETY, DORCHESTER, MASS. MR. P. G. GULBRANSON, ARCHITECT, BOSTON, MASS.

FIRST BAPTIST CHURCH, PERU, IND. MR. E. N. LAMM, ARCHITECT.

[Additional Illustrations in the International Edition.]

FIREPLACE IN THE HOUSE OF H. G. MARQUAND, ESQ., NEW YORK, N. Y.
[Copper-plate Etching.]

A LOGGIA OF THE ELECTRICITY BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MESSRS. VAN BRUNT & HOWE, ARCHITECTS, KANSAS CITY, MO.
[Gelatine Print.]

"ASCOTT," BUCKS, ENG. MR. GEORGE DEVEY, ARCHITECT.

THE SAME FROM THE ROSE GARDEN.



COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

BLEACHING SALT-PRINT DRAWINGS.

PHILADELPHIA, PA., March 31, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Please inform me in your next issue of the *American Architect* how to remove the sensitising from a photograph after the outlines have been put in, in ink, and what kind of ink will not wash by the application? Very truly,

PHILADELPHIA SUBSCRIBER.

[WE bleach salt-print drawings with a saturated solution of bi-chloride of mercury (corrosive sublimate). Higgins's waterproof ink can be used safely. — EDS. AMERICAN ARCHITECT.]

WANTED: MARBLE.

March 31, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Competition designs are being made for a two-million-dollar building, required to have exterior of granite or marble, and the competing architects are required to furnish estimates. In the columns of the *American Architect*, which goes to the office of nearly every one of the competitors, being taken by almost every respectable architect in the United States, there is not a single advertisement of a marble quarry, or a dealer in building-marble. How are the competitors to get careful estimates for the marble-work? Do the quarry-men imagine that their circulars and calendars are kept on file in the offices? It looks to me as if the marble quarry-owners had let the opportunity of their lives go by.

Very truly yours, SUBSCRIBER.

[OUR correspondent has overlooked the cards of two dealers that may be found on our first page; but two out of a possible hundred is a small representation. — EDS. AMERICAN ARCHITECT.]

AN IMPROPERLY "SIGNED" BUILDING.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — If it will not be imposing upon you too much, we would like your opinion on the following question, which has arisen in our practice:

We were employed last spring by a client to prepare complete plans, details, specifications, etc., for a business block in this city, and after performing these services, we, under the direction of the owner, sent invitations for bids, received the bids and opened them with him, in his presence. Then, under the direction of the owner, who changed plans and specifications, cutting down the cost of the building, and later made the plans over entirely, on account of an additional ten feet added to the length of the building. Upon these last drawings contract was made, and the building was built. But when we asked the owner for a payment on the amount due us he refused to allow us more than one-fourth of the regular minimum charge, as per schedule of the American Institute, without giving any reason, and ordered us not to superintend the building, and, furthermore, engaged a foreman to look after the work, and placed in the most conspicuous place in the outside wall a stone tablet with the above-mentioned foreman's name as architect. Of course, we have sued the owner for our commission, but the point we would like to know about is, can we, in your opinion, compel him to remove this lying tablet which he has placed there from pure malice.

An answer to the above through the columns of the *American Architect*, or by mail, will be considered a personal favor.

Yours very respectfully, THE REJECTED STONE.

[WE do not know how you can compel the removal of the obnoxious stone, but, as we assume that you can establish the fact that the building was designed by you and is being erected in conformity with your design, you might establish a claim against the foreman for wrongful impersonation of character; but, if the person whom you style a foreman claims to be himself an architect, he might maintain his right to have his sign, with the owner's permission, on any building being constructed under his charge and the word "architect" being part of such sign could not be removed at your compulsion. — EDS. AMERICAN ARCHITECT.]

BOOKS.

PHILADELPHIA, PA., March 26, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Can you publish in your paper what you consider the best books on "Interior Decoration" (including furniture) with especial reference to the subject historically treated?

Very truly yours, ALBERT M. WHITMAN.

[LITCHFIELD'S "*Illustrated History of Furniture*," published by Estes & Lauriat, Boston, and Meyer's "*Handbook of Ornament*," published by Hessling & Spielmeyer, New York, are good books for your purpose. — EDS. AMERICAN ARCHITECT.]

A QUESTION OF COMMISSION.

CALIFORNIA, April 4, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — You have been very kind in the solution of difficulties between architects and clients: may I lay the following case before you? A gentleman bought a piece of very rough, unimproved property, but a rarely fine building site, of about ten acres in the outskirts of a small town, for which he paid about $25,000, also a piece of an acre and a quarter nearer town for which he paid $11,000. He went to an architect and said, substantially, as follows: "I want you to draw me a plan for a house for my new lot. I don't know when I shall build, I may never build, but I want a plan; you go ahead and make me a plan for what you think the right sort of house for that place for a man with a family of a wife and six small children. I want it of stone, but plain and simple, something in the Spanish-American style, around three sides of a court, and I like

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good-sized rooms. I won't give you any of my ideas; I want to get yours. Then, when you get through with that, I want a plan for my other lot, a smaller house for my daughter with a family of two children. That of stone also. Now, remember, building is all in the air. I want to show them the plans and talk it over in the East. I may never build at all; I won't for a year anyway. You go ahead and make the drawings and I will pay you for them and I will use them, or not, as I like, but of course you will superintend the work if I use your plans."

Before the first plan was finished the man came and said that he wanted an alternative plan for the large lot, in case he decided to build there for his daughter, so three distinct plans were ordered with no other programme or limitation of price than has been mentioned above. The architect laid out his work by the value of the lots and what he knew of his client's taste. He sent in two sets of drawings for the alternative houses for the large lot. They consisted each of ground-plans to one-eighth-inch scale, line-drawings of elevations to same scale, and one perspective of each, scale three-sixteenths-inch, fully rendered in pen-and-ink. Except for interior detail, everything was indicated so that full working-drawings might be made from the drawings. The estimated cost of the larger house was $40,000, of the smaller $30,000. The estimates were not by contractors, but were certainly lower than the actual cost would be. The client was pleased with the plans and suggested no alterations, and no comment was made upon the estimated cost, but the architect's bill was considered too large. What should be the architect's proper fee, taking all things into consideration.

Respectfully yours.

[Taking the story as it is stated, it seems to us that a client who expressly warned his architect that he might never build at all, could hardly have expected to be charged the rate that usually applies to abandoned work. Our correspondent was by this statement put upon inquiry and it was for him to ascertain the terms of the bargain, and not the client, as would be the case under ordinary circumstances. It is unfortunate that the terms of the bargain were not properly prearranged, but judging from internal evidence it seems to us that such a client as this, who is pleased with his site and satisfied with his design, is more likely to build eventually than to abandon his project. We advise a settlement on a fair *per diem* charge for the work done, giving receipt for a payment on account of full commission in case the work is ever carried out. — Eds. American Architect.]

CORRECTIONS.

Washington, D. C.

To the Editors of the American Architect: —

Dear Sirs, — In the article "Comparing Government to Private Buildings," I said "*unfortunately* the correspondence became acrimonious between Mr. Burnham and the Secretary." I should have said "fortunately," as only in this way could the matter be brought before the country, and I find that the most conservative men in this section are taking that view of the case, and congratulating the Institute upon the fact, and Mr. Burnham and his advisers upon their management.

It has been suggested to me that the cost of architectural service to the Government, when the reduced rate at which they should build is taken into consideration, would actually be fifteen per cent instead of nine per cent. Time of construction of the Government Building at Pittsburgh, under the illustration, should have been eleven years instead of 216 months.

The percentage of third-class private buildings and their rate per cubic foot does not agree with text, on account of the omission of one or two of the private buildings which were originally in the manuscript. This error is in favor of Government buildings.

Yours truly, Glenn Brown.

Boston, Mass., April 10, 1894.

To the Editors of the American Architect: —

Dear Sirs, — In Table II of the article on Government Buildings, etc., published in your last issue, it is stated that the floors in the Allegheny County Court-house are of iron and terra-cotta and the roof of iron, terra-cotta and slate. These statements are both in error, as the floors are of brick arches and the roof of Akron flat-tile, wired with copper wire to iron purlins. As I had the pleasure of superintending that work I take an interest in having this corrected.

Yours truly, Chas. D. Austin.

In the last paragraph of Mr. Bragdon's paper on "Colonial Architecture in the Genesee Valley" the Greig mansion at Canandaigua was by error called the "Grey" mansion.

EXHIBITIONS

Boston, Mass. — *Annual Spring Exhibition of Water-colors, Pastels, Black-and-Whites, and Sculpture:* at the Boston Art Club, April 9 to April 28.

Oil-paintings by J. Appleton Brown and Mrs. Agnes A. Brown: at Doll & Richards, 2 Park Street, April 9 to April 18.

Loan Collection of Paintings by William Morris Hunt: at the St. Botolph Club, April 3 to April 21.

Oil-paintings by R. L. Newman and J. A. McNeill Whistler: at the Museum of Fine Arts, March 27 to April 17.

Several hundred Specimens of Textile Designs of all countries, from the second century to the present time, from the collection given by Denman W. Ross; also a collection of Japanese Color-prints: at the Museum of Fine Arts, during April.

Sketches and Portraits by Mrs. W. L. Mathews and Miss Emma H. McLauthlin: at Chase's Gallery, 7 Hamilton Place, April 12 to April 20.

Brooklyn, N. Y. — *Third Annual Exhibition of Architectural and Decorative Drawings of the Department of Architecture of the Brooklyn Institute of Arts and Sciences:* at the Brooklyn Art Association Galleries, 174 Montague Street, March 30 to April 21.

Buffalo, N. Y. — *Exhibition of Architectural Drawings:* at the Buffalo Library building, now open.

Chicago, Ill. — *Annual Exhibition of Water-colors:* at the Art Institute, April 3 to May 6.

Sixth Annual Spring Exhibition of the Chicago Society of Artists: at the Society's Galleries, April 16 to April 28.

New York, N. Y. — *Sixty-ninth Annual Exhibition, National Academy of Design:* 23d Street and Fourth Avenue, April 2 to May 12.

Sixteenth Annual Exhibition of the Society of American Artists: at the Galleries of the American Fine Arts Society, 215 West 57th Street, March 12 to April 14.

Philadelphia, Pa. — *Fourth Annual Exhibition of Water-colors and Pastels:* at the Art Club Galleries, March 26 to April 22.

NOTES AND CLIPPINGS

Steam and Water-power Electricity. — According to an article by United States Consul Monaghan, appearing some time since in the *American Machinist*, if Switzerland, or any country with streams and climate like hers, is to win her way into the world's markets and take a place in the front ranks, it must be by some better method than the use of electricity gained and transmitted from rivers and waterfalls. The following table, recently published in Chemnitz, shows what 50, 300 and 500 steam horse-power costs in England, Germany, Bohemia and Switzerland per annum.

Country.	50 horse-power.	300 horse-power.	500 horse-power.
England.....	$24.24	$12.58	$ 9.88
Germany	29.21	15.52	13.51
Bohemia.....	27.50	14.74	12.97
Switzerland..	46.82	29.61	25.54

Compared with the above, the cost of the same amounts of horse-power of electricity transmitted 3.1068 miles (5 kilometres) in an air-line in Switzerland, according to results published in connection with the foregoing table, is as follows: Fifty horse-power, $30.88; 300 horse-power, $16.98; 500 horse-power, $12.54. But to this must be added the transmission cost, which will make the total as follows: Fifty horse-power, $57.68; 300 horse-power, $31.27; 500 horse-power, $25.48. It is only by building a big plant, 500 horse-power at the very least, that electricity begins to show any profit that would commend it as a substitute for steam.

Maple Flooring. — Among the noteworthy features of recent lumber-trade development is the rapidly-increasing demand for maple flooring. Improvement in the method of manufacture has kept pace with the growth in demand for product; or perhaps it is more exact to say that the recognition of maple flooring has been forced on the attention of consumers by the enterprise of manufacturers in turning out a perfected product and urging it on public attention. A few years ago all the maple flooring used was worked out on orders by a few planing-mills. The hardwood dealers carried maple strips in their yards, and had them dressed and matched when they happened to receive an order for flooring. Now great manufactories have been established for the sole purpose of producing maple flooring. Exact, strong and swift machinery has been invented to work out the stuff. The boring machine has rendered nailing easy, and now comes the end-matching invention. Maple flooring has come to be regarded as the thing indispensable in most public buildings and is used largely in private dwellings. Such an extent has the demand reached that the larger dealers are obliged to make contracts for millions of feet far in advance of requirement, the same as is done with pine, or any other wood of extensive sale and consumption in the building trades and manufacturing. — *Northwestern Lumberman.*

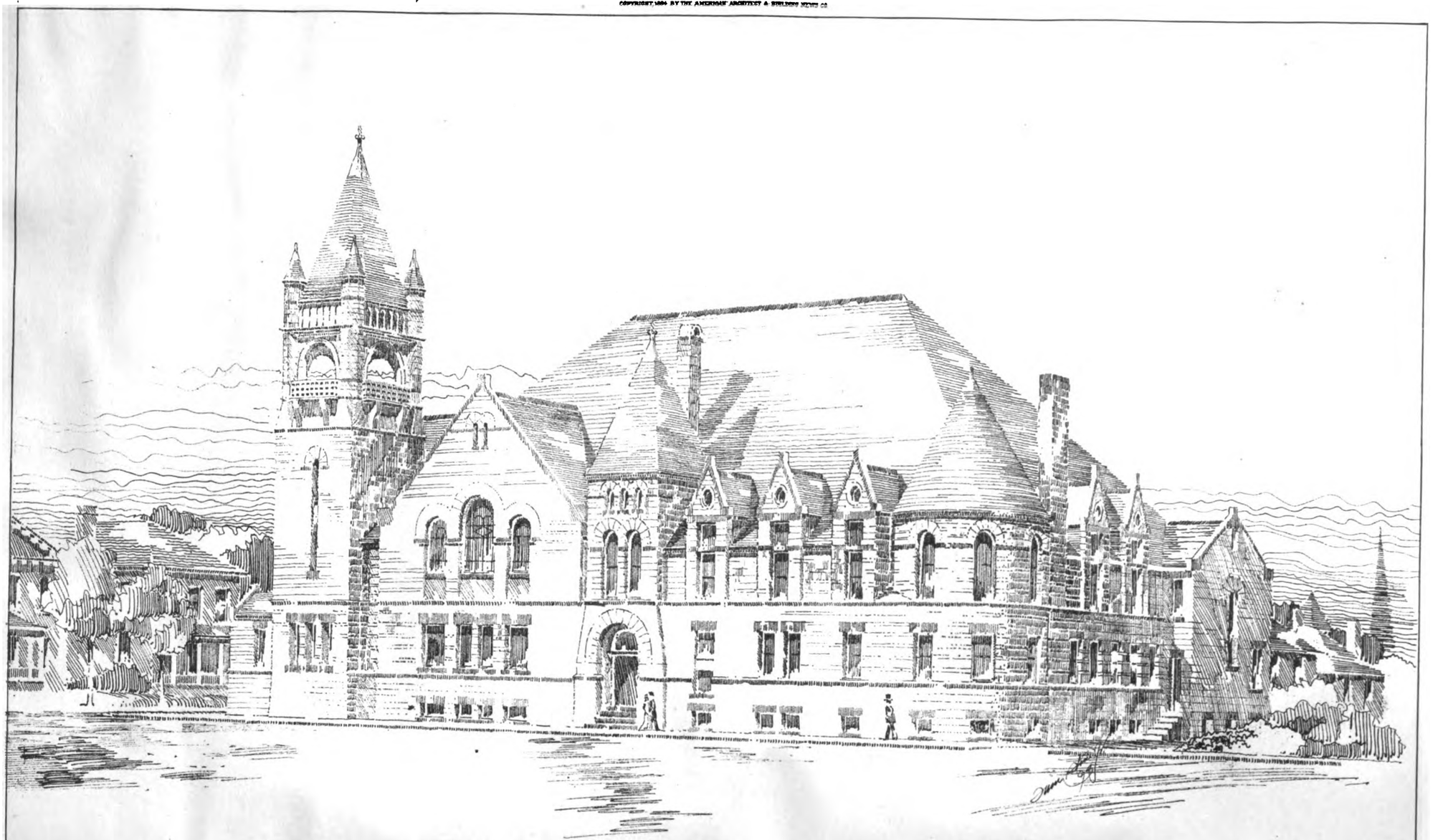
Death of Dr. Lolling. — Greek archæology suffers an irreparable loss in the death, on February 23, of Dr. Lolling, for the last ten years director of the department of inscriptions in the National Museum of Athens, editor of Baedeker's "*Greece*," and, since 1879, librarian of the German Institute in Athens. He excelled most in epigraphy, and the Greek Government fittingly recognized his astonishing achievements in this field by making him custodian and editor of the enormous body of inscriptions which the eager excavations of recent years have brought to the central museum at Athens. His catalogue of these inscriptions, a work evolving enormous and ingenious labor, is well advanced in MS., though only the first part, on votive inscriptions, is published. Many American scholars remember gratefully the unselfish kindness of this modest, sad man, and regret that attainments and achievements such as his should have been haunted by a sense of defeat and failure. — *N. Y. Evening Post.*

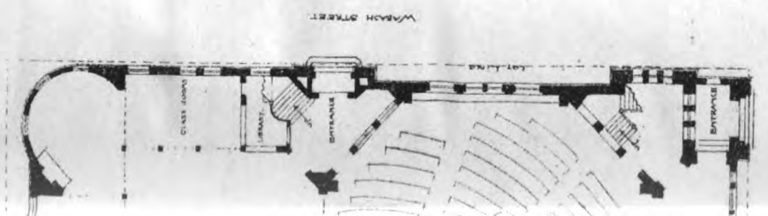
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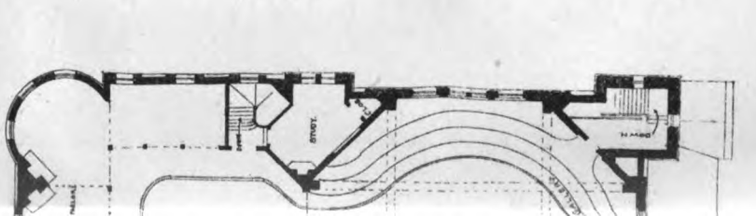
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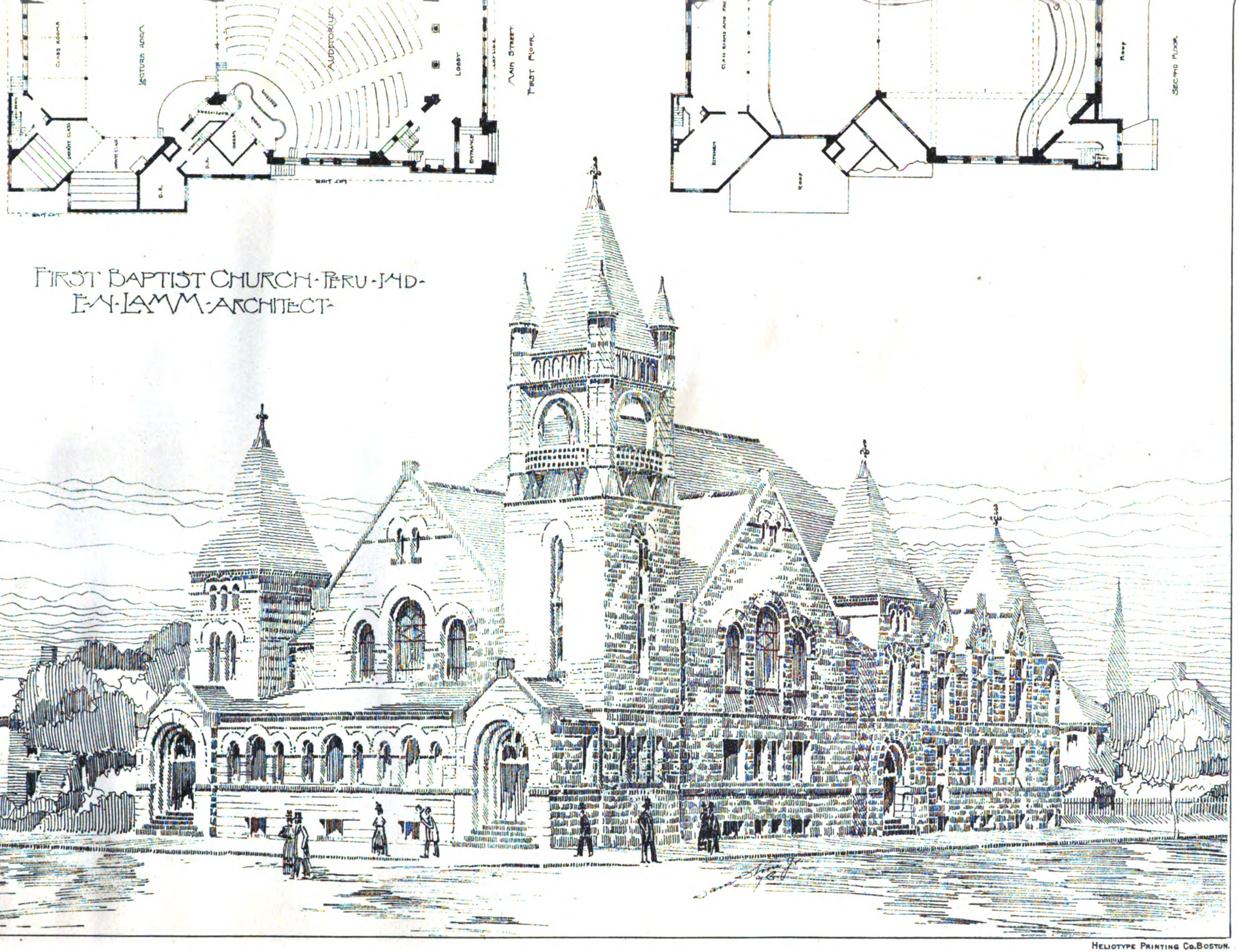
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Proposed Church and Parish House for the Grove Hall Universalist Society

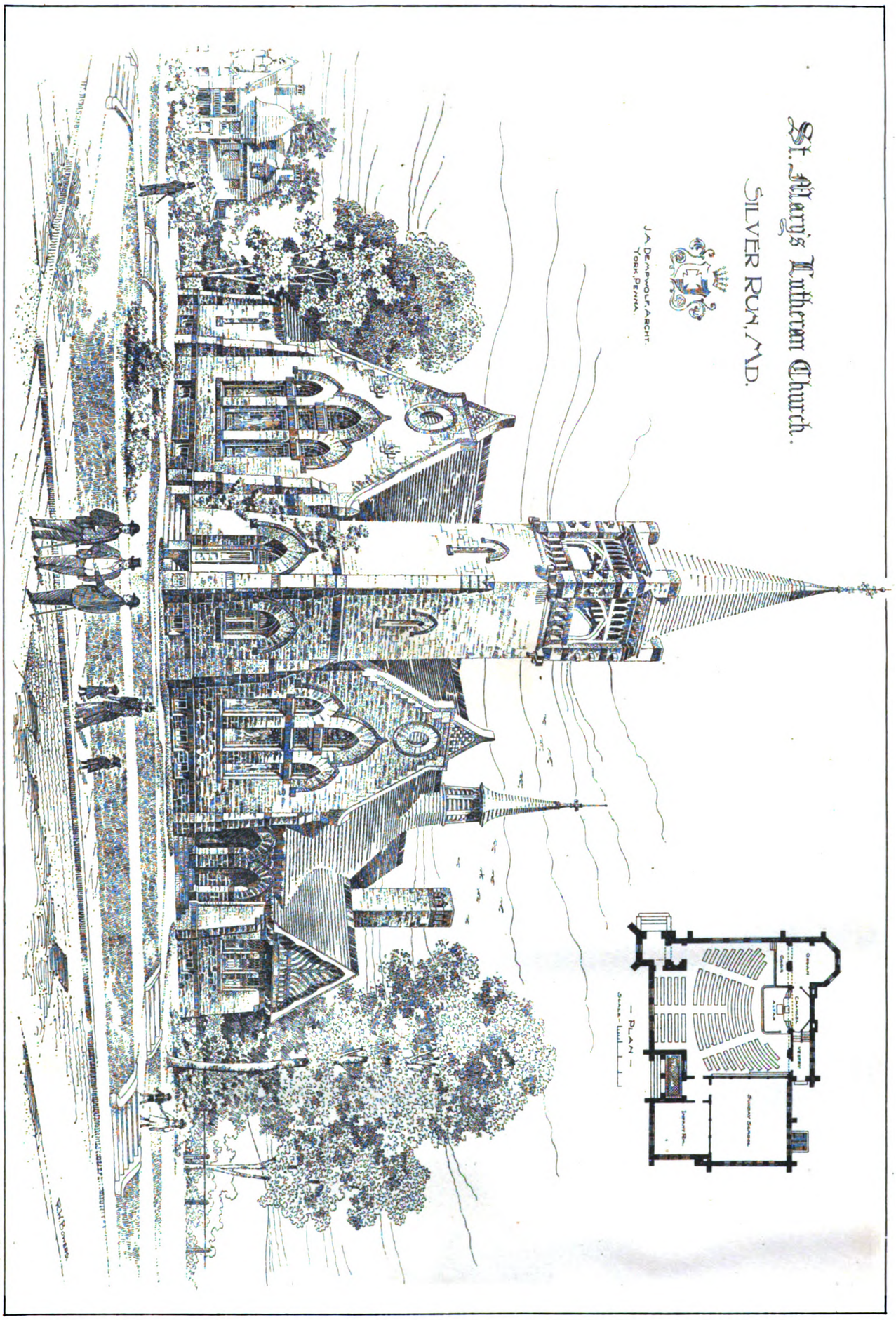
P. C. Gulbranson, Architect, December, 1892.

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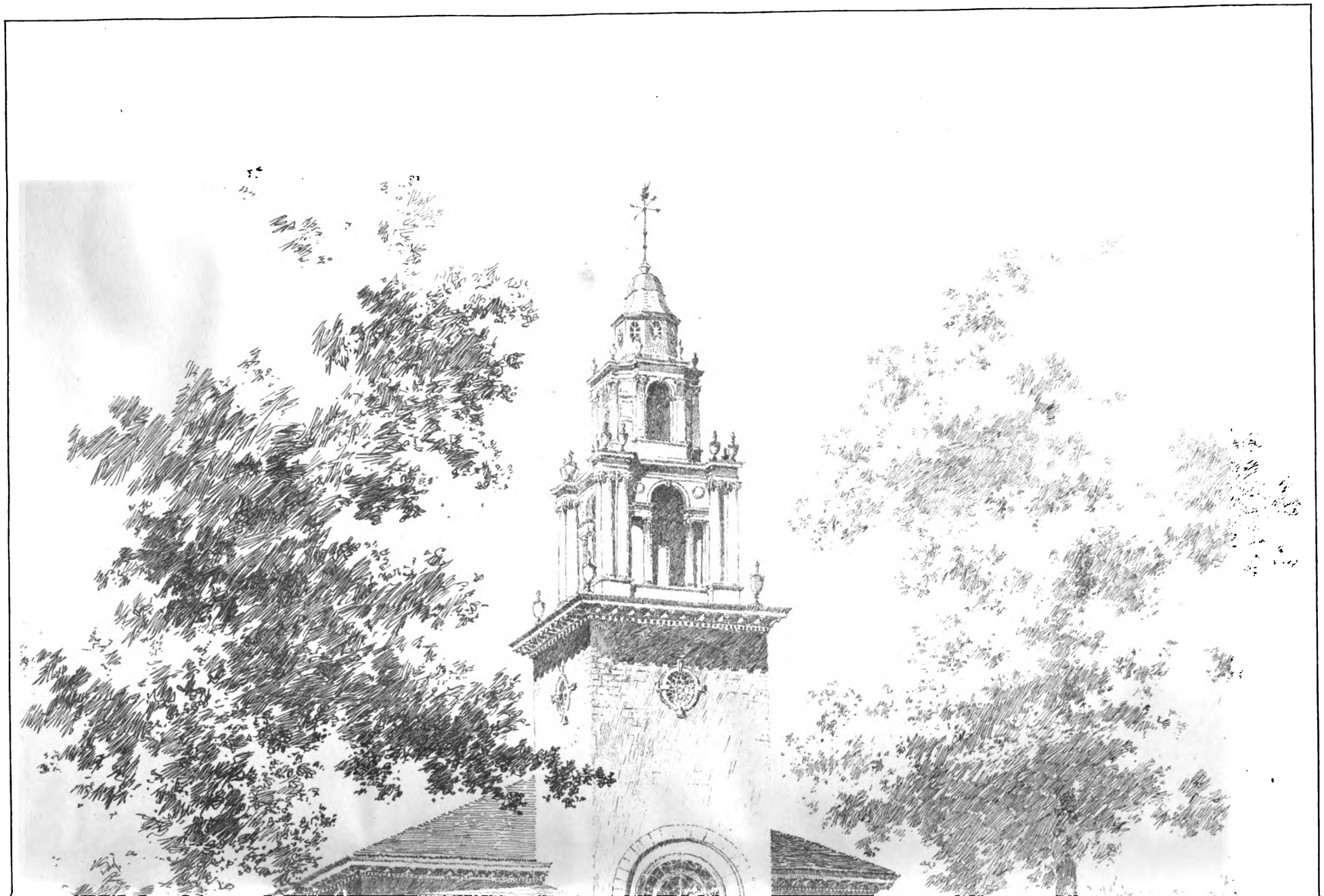
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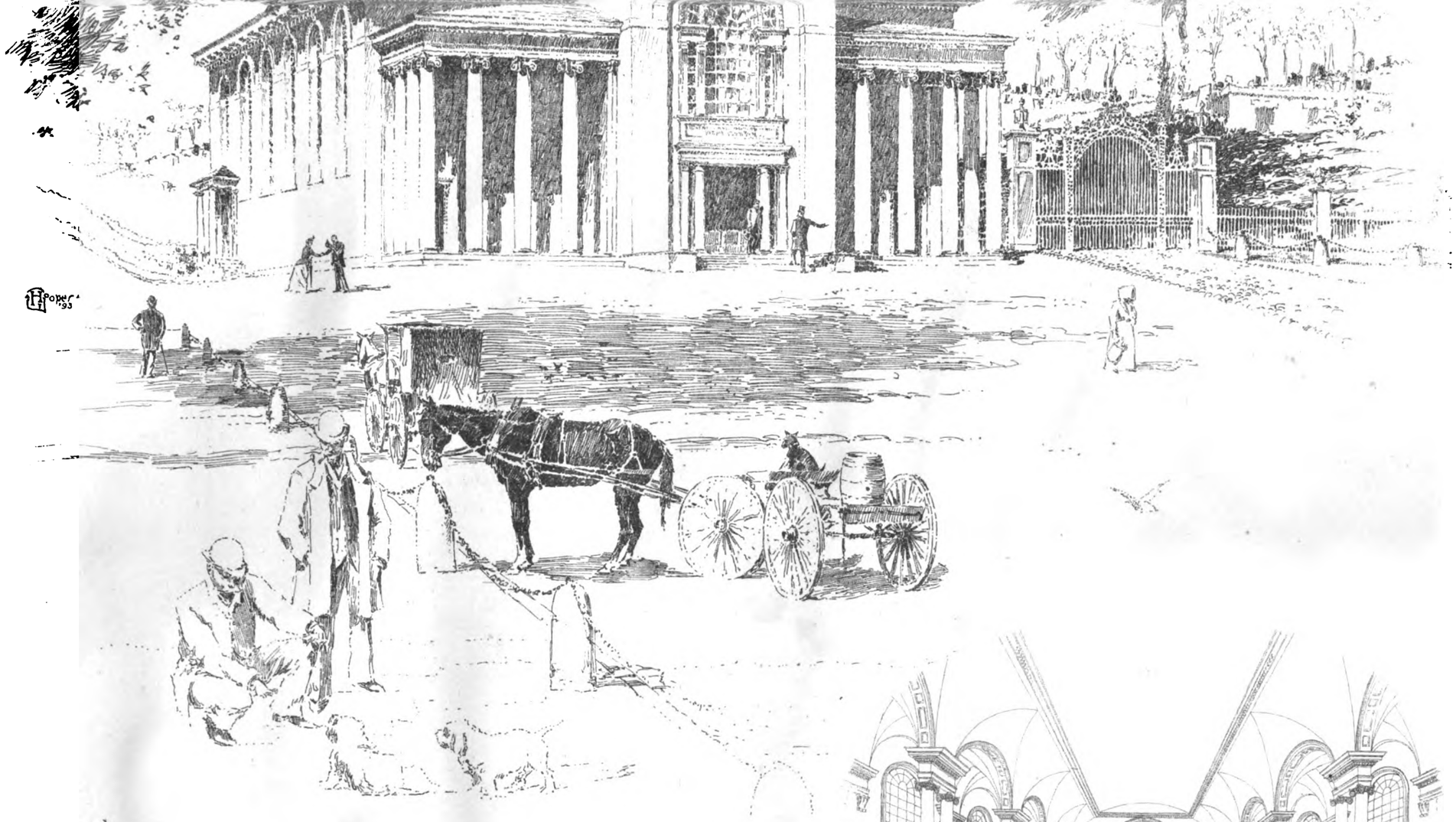
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(REJECTED)

DESIGN FOR THE FIRST CHVRCH AT PLYMOVTH MASS.

JOSEPH EVERETT CHANDLER ARCHITECT

9 PARK ST. BOSTON.



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THE AMERICAN ARCHITECT AND BUILDING NEWS.

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APRIL 21, 1894.

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THE subject of the fire-losses of the year is occupying, perhaps, even more than the usual amount of attention in the newspapers. Roughly speaking, one hundred and fifty million dollars' worth of American property disappeared in 1893 in fire and smoke, or was ruined by water-soaking incident to attempts to save it. Counting in the cost of maintaining insurance companies, to distribute the loss over the community, and that of keeping up fire-departments, to prevent the losses from being even greater, we may safely say that the American people paid out last year not far from three hundred million dollars, none of which they will ever see again, in consequence of fires. If our recollection serves us, this is a great deal more than the annual cost of supporting the entire military force of France and Germany combined; yet we are constantly told that both those countries are on the verge of revolution, on account of the intolerable burden of militarism, while our people bear their far greater burden of fire-loss with apparent apathy. One reason for this is, probably, that the fire-loss bears so indirectly on ordinary people. The great mass of citizens are interested directly only in dwelling-house insurance, while the main part of the loss comes from the destruction of large warehouses. Of course, the common people have to pay, by premiums on dwelling-houses altogether disproportionate to the risk, the difference between the actual losses on mercantile risks and the inadequate premiums charged for such risks; but the common people have not time for investigation, and simply pay their premiums, without further question. Far worse than the insurance premiums, however, is the cost of fire-department service. No doubt, it would be impossible to dispense entirely with fire-departments, but, when we consider that the annual cost of maintaining them in many places is, at least, ten times the total annual loss by fire, and probably four times the amount of all the fire-insurance premiums paid, it certainly seems as if there were room for improvement in this sort of service. The first thing is, of course, better construction of buildings. If buildings will not burn, it will not be necessary to keep up costly fire-departments to put them out; and to make buildings so that neither they nor their contents can burn is the most pressing problem of the time in this country.

THE question of the leakage of gas-mains buried in streets is becoming a serious one for those who have the misfortune to live on city streets invaded by large mains. It is said that about one-fourth of the gas forced into the mains at the works leaks out before it reaches the burners, and most of the leakage is, necessarily, poured into the ground along the route, and is thence slowly dissipated into the air, either directly, or through the houses along the streets, into which it is drawn, particularly in winter, by the powerful inward current which always tends from the ground outside to the cellars of inhabited houses. Whether the substitution of the deadly water-gas for the less poisonous hydro-carbon compounds of the old-fashioned illuminating-gas will work a serious change for the worse in the ground-air of cities can hardly be decided yet, but the change is, at least, not likely to be for the better; and municipal authorities would do well to regulate the laying and maintenance of gas-pipes more strictly than has hitherto been the rule. The inhabitants of one street in New York — East Sixty-sixth Street — have recently been driven almost into rebellion by the troubles which have attended the laying of a gas-main, into which the gas has not yet even been turned. A company was organized, a year or two ago, for supplying portions of New York with gas from a plant situated on Long Island, the gas being conveyed across the East River by a tunnel. The tunnel is not yet completed, but an immense main, thirty inches in diameter, has been laid through Sixty-sixth Street, in so careless a manner, it is said, that the present gas-mains and sewers in the street have been broken, and the cellars of some of the adjoining houses have been so filled with gas that the occupants have not dared to light their furnaces for fear of an explosion; while in many of them there have been cases of low intermittent fever, due, as the physicians say, to the foul emanations from the soil. It is now proposed by the Board of Public Works to put down an asphalt pavement in a portion of the street, but this measure, otherwise an excellent one, is opposed by the residents, on the ground that, if the surface of the street is rendered impervious by asphalt, all the foul gases from the ground will have to find their outlet through the cellars, instead of principally by direct diffusion into the air of the street, and their troubles will be intensified. The New York Board of Health, which has the reputation of being efficient in its work, has promised to look into the matter, and it is to be hoped that its investigations will extend to the general subject of the effects of gas-leakage on health. It is worth remembering also that leakages of gas are said to have a very prejudicial effect on asphalt pavements, so that the Board of Public Works may have something to say as to the extent to which gas-companies should be held responsible for the results of carelessness in their work.

THE offer by the Metropolitan Traction Company, of New York, of a prize of fifty thousand dollars for a practical plan for propelling street-cars, superior to the overhead trolley system, and not more expensive in operation, is said to have brought out more than three thousand competing devices, some of which seem to have been simply ridiculous, while others really promise good results. Among the best of the competing schemes appears to be the Siemens and Halske system, using an underground trolley, which is already in successful operation at Buda-Pesth. The inventors of this system submitted a statement of earnings and operating expenses on the Buda-Pesth lines, which showed that the operating expenses for six months previous to June 30, 1892, were less than forty-one per cent of the receipts. As the operating expenses of the New York horse-car lines are about sixty per cent of the receipts, the Traction Company feels that the Buda-Pesth system offers advantages enough to warrant a trial, and an experimental line will probably be equipped as soon as the consent of the Railroad Commissioners can be obtained. The General Electric Company and the Westinghouse Electric Company have each submitted plans, similar to the Buda-Pesth system, but the latter will probably be tested first.

WE have been favored with a copy of a pamphlet, describing the Chase-Kirchner "Aerodromic System," for the improvement of transportation, of which Mr. H. W. Kirchner of St. Louis, a well-known architect and Fellow of the Institute, is one of the inventors. We cannot go into the details of the system, which is very carefully worked out; but our readers can, perhaps, form a general idea of it by supposing a train of cars to be furnished with inclined planes fixed overhead, at an angle to be regulated by the engineer, in such a

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way, that, by adjusting the angle, the weight of the train can be, in greater or less part, lifted from the rails. In the Chase-Kirchner system, the cars are suspended from an overhead track, and the routes are, as nearly as possible, laid out in straight lines, so as to render possible the great speeds at which, according to Professor Langley's observations, the lifting power of the air can be most economically utilized. The scheme seems perfectly practicable, and indicates a direction in which engineering thought is likely to be profitably employed.

TWO rich and generous members of the Boston Art Club have, in the name of the Club, offered a prize of five thousand dollars for the best American painting shown in the annual exhibition of the Club for 1896. The details of the offer are not yet made public, if, indeed, they have been settled; but it is certain that this splendid prize will be used in such a way as to promote to the utmost the interests of American art, without reference to those of the Club. Various other prizes have already been established by the Club, both for oil and water colors, in addition to the sums annually set aside for the purchase of meritorious works; so that, for the next two years, at least, the Boston Art Club must rank among the foremost agencies in this country for encouraging the development of artistic talent.

PROFESSOR MELANI, in a recent number of *Arte e Storia*, comes courageously to the support of the architects and architecture of America, which have been, as he thinks, unjustly treated in a little book, published by Hœpli, of Milan, on *La Vita Americana*, by Dr. Tullio De Suzzara-Verdi. The author of this work dismisses the subject which interests Professor Melani in a brief sentence: — "As for architecture in America, there is practically none"; but he goes on to explain that, "There are, indeed, here and there some elegant edifices, but they are a mixture of all the orders and all the styles." The author of the book does not pretend to be an architect, and Professor Melani finds it easy to convict him of want of acquaintance with the actual condition of American architecture, on which he is himself, as readers of his interesting letters to this journal will remember, one of the best authorities in Europe. After citing the names of "the Signori Kim, Mead, White" as representatives of the classical school in American architecture; "the Signori Shepley, Rutan, Coolidge e Gibson" as among the "architetti modernissimi," "il Romeyn" as one of the most distinguished architects, "nelle costruzioni privati," he goes on to mention, among architects of repute for general excellence, "il Siter e il Cudell," "e altri e altri ancora;" and says, very properly, that the profile of a cornice, or the balancing of a front, is not the whole of architecture, and that, in his opinion, it is understood "a little better in America than anywhere else" that "architecture should be made of ideas, and not of lines," and, in consequence, that the American architects "make architecture, and not architectural designs."

THIS is certainly a very pretty and discriminating compliment, and our architects will be grateful to Professor Melani for his appreciation. In regard to our painters, however, he is not so liberal with his praises, for reasons which he gives in words as just as they are forcible. Speaking of the Paris Exhibition of 1889, he says that what struck him most, in looking at the works of the American artists, was to see, in the Catalogue, appended to the name of each, the information, "Pupil of Bonnat and Collin," or "Pupil of Bouguereau and Lefebvre," or of "Boulanger and Carolus Duran," or of "Gérôme and Courtois," or of one, two or three other favorites of Parisian artistic fashion. Apart from the doubtful taste of having their names appear in public, escorted, as it were, by the more distinguished ones of their masters, an arrangement, however, for which, as he explains, the artists themselves were not responsible, he says that the thought that a painter of Boston should be the product of one of Paris, or artists of Washington must trace their training to Versailles, gave him "un stringimento al cuore." "How," he asks, "can these Americans, who have such great and just reason for pride in their nativity, condescend to wish, in painting, to be anything else than the free citizens of the youngest, most active, rich and modern State in the world?" "Why do they not stay at home to study painting? Why do they not study their own country, their own life, and the poetry of their own soil?" "For me," he continues, "I cannot understand how the Americans can remain content with reproducing at home an art which does not belong to them, and counterfeiting a sort of painting which reflects unfaithfully their own character. Let them even pursue the highest aims, in the manner in which they now do it, they will never succeed in interesting those spirits which understand deeply the mission and the significance of the arts." "Whether it is Gérôme, or Orchardson, or Bonnat that hypnotizes them, one painful impression always remains: — the absolute lack of American painting, and the contrast between this art and its sister, architecture, which has made itself American in fulfilment of the national needs."

A LECTURE was recently given before the Society of Architects in Berlin, by Herr Boettger, on the present state of the science of hospital-planning, which has much interest. As nearly every summer sees some important congress of sanitarians or physicians, at which hospital-construction is discussed, it is not strange that ideas on the subject are brought forward, tested, and abandoned, or developed further, in rapid succession, and the hospitals of this year differ materially from those of even three or four years ago. According to Herr Boettger, while there is very far from being unanimity among experts on many points of hospital-design, it is generally agreed that, for large establishments, with more than one hundred beds, the system of wards connected by corridors is to be condemned, and that isolated pavilions should be exclusively employed. It has usually been considered that, with isolated pavilions, the cost of supervision and service is much greater than where the wards are connected by corridors, but Herr Boettger says that, if the buildings are carefully grouped around the administration offices, this is not the case. The theory once prevalent, that hospitals for cities must be at or near the centre of population, is also becoming obsolete. Great improvements have been made in the rapidity and comfort of ambulance service, and the most recent hospitals are built far enough outside the cities to secure fresh air. The immense new establishment at Hamburg, which comprises eighty-one separate buildings, is about five miles from the city, and so careful are hospital directors to avoid what Herr Boettger calls the defiled air of great towns that the direction of the prevailing wind is studied, so that, even at five miles distance, the city air may have little chance as possible of reaching the patients.

CELLARS are now abandoned for the pavilions of large hospitals, as they have long been for small ones. No use can, or should be made of them, and it is much better to allow the air to blow freely through under the first floor. The best number of patients for a ward in general hospitals is generally agreed to be thirty, with twenty as the maximum for wards containing certain classes of patients. To secure the best effects of sun and air, the long axis of the wards should run north and south, instead of east and west, as in many of the older Continental hospitals. This gives sun on both sides of the room during some part of the day, and allows the "day-room," or "sunning-room," which is now an indispensable part of every large hospital ward, to be placed at the south end, where it does not shade any windows. Roofs should be flat, without air-spaces between the rafters and ceiling, and covered with "wood-cement," or other similar material. Opinions still vary as to the best flooring. Some still prefer wood, but Herr Boettger considers that a pavement of smooth concrete, or Mettlach tiles, is much better, if suitable provision can be made for keeping it warm. The best material for walls is now agreed to be brick. Probably it is intended that they should be built hollow, for Herr Boettger continues that the inside face should be laid as smoothly as possible, with very close joints, and painted in oil to a height of seven feet above the floor, or else covered to that height with tiles. For hospitals for infectious diseases, the newest idea, which is certainly a good one, is to provide, in the hospital grounds, a number of monolith platforms of concrete, of suitable size, on which temporary structures can be erected at any time, either in winter or summer, in a few days, or even in a few hours, and cleared away as quickly after the exigency is past.

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OFFICE-HELP FOR ARCHITECTS.[1]—XXVIII.

SECTION II.—SLOW-BURNING CONSTRUCTION:

§ 336. Materials:—White pine, yellow pine and spruce. For the framing (filling-in) spruce is best, unless a very good quality of white hemlock is available, or yellow pine is not too expensive. For the under-floors white pine is best and for the upper-floors yellow pine.

The principal features in slow-burning construction are the massing of the framing timbers into large pieces which will lose not to exceed 25% by burning, the avoidance of all hidden spaces in which fire can lodge or travel, and the floors so arranged as to permit of the holding of about 1″ of water on them in case of fire. To secure these advantages, the floor areas are divided so as to permit of the columns being spaced so as to support from 150 to 400 square feet.

The columns are connected longitudinally by heavy girders supporting heavy floor-beams from 3′ 0″ to 7′ 0″ on centres. The floors are made up of one course of 2″, or thicker, planking, 5½″ face, tongued-and-grooved or splined, and one course of ⅞″ to 1¼″ × 3½″ tongued-and-grooved hard or yellow pine.

§ 337. Proportions:—General proportions are given in Table XL, but for special cases the sizes should be carefully computed. In the general scheming, it should be arranged, so far as possible, to make the beam divide the girders into an unequal number of equal parts.

§ 338. Framing:—The best method of framing is to use the Goetz-Mitchell or Duvinage column-caps, supporting the girders on the brackets which form a part of the cap, and framing the beams to the girders with Duplex or Goetz beam-hangers. In this case the top of the beam should be set ⅝″ above the top of the girder to allow for shrinkage. A somewhat less expensive framing is to rest the beams upon a 1½″ notch gained into the girder, leaving the lower 4″ of the girder untouched, and to rest the girders on oak brackets bolted to the columns; they being strapped across the column with ⅝″ × 2″ wrought-iron straps. The beam may be sized onto a 2″ × 4″ strip spiked to the bottom of the girders.

From the centre of the building the floor-beam should slope at the rate of ½″ for 15′ 0″ toward the sides. The planking should be laid on the beams parallel with the girders with the joints made as tight as possible and thoroughly nailed. Along the outside walls, scuppers or openings the size of a half brick should be left, with the bottom of the hole 1″ below the top of the planking if the beams have not shrunk to their full extent. The joint between the side wall and the planking should be made with bright tin or copper plate with spouts carried out through scuppers, there being a light tin flap put in the spout to prevent back draughts. The flashing should be double as there will be considerable shrinkage in the floor-beams. Flashing should be carried up 6″ on the wall and out 8″ on the floor-plank. On top of the floor-plank should be placed a thickness of waterproof or resin-sized building-felt, and on this the upper-floor laid diagonally and well nailed through. All planking should be kept away from the wall running parallel to it, making the joint a distance equal to 1″ for 15′ 0″ spans, so as to prevent the pushing out of the wall if the plank swells. Plank curbings 4″ thick should be carried around all openings, carried up 1″ above the line of the finished floor, so as to permit of flooding the floor. All timber and lumber should be mill-dressed and should be left unpainted for at least two years after the erection of the building. All partitions should be made of 2″ tongued-and-grooved or splined plank placed either horizontally or vertically. The general lay-out would follow the lines shown in Figure 121.

TABLE XL.

PROPORTIONS FOR SLOW-BURNING FLOORS.

Girders.	Span	12′ 0″	13′ 0″	14′ 0″	15′ 0″	16′ 0″	17′ 0″	18′ 0″	19′ 0″	20′ 0″
	Breadth	6″	8″	8″	6″	6″	8″	8′ 6″	10′ 6″	10′ 8″
	Depth	12″	12″	14″	16″	16″	16″	16′ 20″	16′ 20″	16′ 20″
Beams.	Span	12′ 0″	13′ 0″	14′ 0″	15′ 0″	16′ 0″	17′ 0″	18′ 0″	19′ 0″	20′ 0″
	Spacing	4′ 0″	4′ 4″	4′ 8″	5′ 0″	5′ 4″	5′ 8″	6′ 0″	6′ 4″	6′ 8″
	Breadth	4″	4″	4″	6″	6″	6″	6″	6′ 4″	8′ 6″
	Depth	12″	12″	12″	12″	12″	12″	14″	14′ 16″	14′ 16″
Under-floor.[1]	Depth	2″	2″	3″	3″	3″	3″	4″	4″	4″
	Safe uniform load.	200	200	200	200	200	200	200	200	200
	" conc'ted "	400	450	450	500	500	500	600	650	700
	Dead load sq. ft.	15	15	20	20	20	20	25	25	25

[1] 5½″ face for all floors throughout.

Based on a fibre strain of 750 pounds for beams and 1,000 pounds for girders, per square inch.

These results will give stiff floors whose strength will not be impaired by any ordinary fire. Where the machinery is very light or absent, and the loads will be only those due to people, the thickness of the floor-plank may be reduced 1″ provided that in no case shall the plank be less than 2″ thick.

SECTION III.—ORDINARY FRAMES:

§ 339. Materials:—Oak, yellow pine, white pine, spruce and hemlock. Oak is very seldom used; yellow pine is much used in the South, and for girders; white pine in places in the West, spruce and white hemlock in the Eastern and Eastern Middle States, and Oregon pine on the Pacific Coast. Spruce is a little better than white hemlock, but requires careful watching and culling to insure against getting large knots in the bottom of girders and beams. All of the tables refer to spruce.

§ 340. Proportions:—The members will be proportioned almost entirely to fulfil the condition of stiffness for all beams. Girders should be calculated for a fibre-strain of 750 pounds per square inch. The data of Table XLI give sizes for the floor-beams of dwellings and will give satisfactory results, if the framing and bridging are properly done. In New York City no floor-beam can be less than 3″ broad.

TABLE XLI.

DATA RELATIVE TO FLOOR-FRAMING.

Spans.	DWELLINGS. Breadth.	Depth.	Spacing.	PUBLIC BUILDINGS. Breadth.	Depth.	Spacing.
Up to 8′ 0″	2″	8″	16″	2″	10″	16″
8′ 0″ to 12′ 0″	2″	10″	16″	3″	12″	16″
12′ 0″ to 16′ 0″	2″	12″	16″	3″	12″	12″
16′ 0″ to 20′ 0″	3″	12″	16″	3″	16″	16″
20′ 0″ to 25′ 0″	3″	14″	16″	4″	16″	12″

§ 341. Bridging:—Use 2″ × 3″ or 2″ × 4″ stuff in double continuous rows, with each end of each piece nailed with two nails. Bridging should be put on so as to divide the span into a number of equal parts, each about 4′ 0″ long, but never exceeding 6′ 0″ long. The cutting of the ends of the pieces should be done in a mitre-box so as to secure a good bearing against the floor-beams.

§ 342. Framing:—(See Chapter VIII.) Each beam should be fully carried on a piece of an area equal to the load on the

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[1] By George Hill, Consulting Engineer. Continued from No. 953, page 148.

ABBREVIATIONS AND SYMBOLS.

= equal to.
|| parallel to.
÷ divided by.
× multiplied by.
+ added to.
a^2 a multiplied by itself.
$a > b$: — a greater than b.
$a < b$: — a less than b.
$\frac{a}{b}$: — a divided by b.
∴ therefore.
□′ square feet.
□″ square inches.
8# read 8 pounds per lineal foot.
C channel bar.
I I-beam.
T T-iron.
L angle iron.
deck beam.
● round section.

I ton = 2,000 pounds as this is the conventional ton, the legal ton is 2,240 pounds, but is rarely used.
l = the length between supports of any beam or girder or height of any column, always in feet.
b = breadth of any beam or girder, always in inches.
d = depth of any beam or girder, or the least transverse dimension of any column, always in inches.
L = total load uniformly distributed coming on any piece in pounds.
L^{pf} = " " " " per square foot in pounds.
W = concentrated load on any piece in pounds.
s = span of any arch or truss between centres of end pins in feet, or spread of footing courses.
A = area of any section in square inches.
M = maximum bending-moment in inch pounds.
n = distance of centre of gravity of section from either top or bottom edge in inches.
I = moment of inertia, neutral axis through centre of gravity.
R = moment of resistance of section.
r = radius of gyration, in inches.
Sc = safe compressive strain in pounds per square inch.
St = " tensile " " " " " "
Ss = " shearing " " " " " "
S = strain per square inch in extreme fibre.
P_e = upward reaction of support at left-hand end of beam.
P_f = " " " " " right " " " "
e = distance of centre of gravity of load from left hand of beam.
f = " " " " " " " " right " " "

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beam divided by 1,400 pounds. Each beam should be brought close up to the studding and be spiked to it where the beams run end-on to the studding. A header should be cut-in and the beams framed around all openings for hot-air flues, chimneys, stair-wells, and the like. Framing of beams should be by means of $1\frac{1}{4}'' \times 2''$ strips spiked along the bottom edge of the header, or else by means of Duplex or Goetz joist-hangers. Whenever there are three or more tail-beams framing into a header, the header should be doubled. Whenever a header frames into a trimmer-beam at more than one-fourth span from a bearing, the trimmer should be doubled. Tiers of beams running parallel to rows of studding should begin and end with a beam brought close to the studding and well spiked to it. Ribbon girts should be either $1\frac{1}{4}'' \times 4''$ or $2'' \times 4''$, gained $1''$ into the studs and well nailed. Vertical sections of all frame partitions should be made for the carpenter, so arranged as to equalize the shrinkable stuff throughout. Whenever a partition runs up through a tier of beams, either the flooring must run through in places, or else iron ties must be used to carry the tie through.

When it is necessary to start a stud partition at a tier of beams, the studs should rest on a $\frac{5}{8}'' \times 4''$ iron plate, punched for two or more $\frac{5}{8}''$ lag-screws and screwed to the bottom side of the beam; the plates running so as to catch the studs as shown in Chapter VIII, Figures 118, 119 and 120. In addition, each stud should have a stay-bolt $\frac{5}{8}''$ in diameter, with large washers to guard against accident.

§ 343. Top Surfaces: — (See Section II of this chapter.)

Remarks: — The under-floor should be laid diagonally, well nailed and of mill-dressed stock, free from all rot and from other imperfections. Upper-floors should be laid on two or three thicknesses of building-felt; should never exceed $3\frac{1}{2}''$ face; may be as light as $\frac{5}{8}''$, but $\frac{7}{8}''$ is better for any place where there is much wear; should be planed off, filled and covered as soon as laid; should be run at right angles to the beams and nailed through to them. In good work, should be laid in the rooms after the base and other trim are in place.

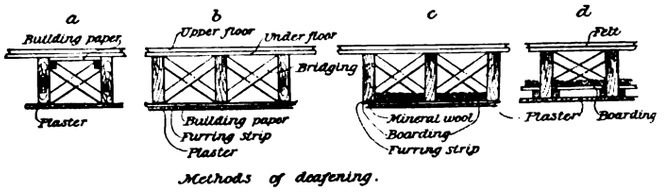
§ 344. Bottom Surfaces: — Are best finished with lath and plaster. Of lathing there are two kinds, wood and metal.

§ 345. Wood Lath: — Are usually of spruce, straight, free from knots, bark or stains, and from sap-wood or rot. They should be spaced $\frac{3}{8}''$ apart in the clear, and should have a bearing every $16''$, with the ends of the lath on a solid bearing. The laths should break joints every twelve courses, and over all door and window heads. Good nailing must be had for both ends of the lath in all angles for both surfaces. Where there are needed heavy false arches, beams, pilasters, and the like, a bracketing of wood $16''$ on centres is nailed up and the lath is nailed to it. The lathing for any of the patent, rock or hard plasters is similar in all respects, except that the laths are placed $\frac{1}{4}''$ apart.

§ 346. Metal Lath: — Is of two general kinds; heavy wire-cloth made of about No. 16 wire with about a $\frac{3}{8}''$ mesh. This is the best for usual work, the soffits of all stairs, around small pilasters, beams, cornices and the like, being generally applicable in a building, and relatively inexpensive. This lath should be put up with supports every $16''$, being nailed to the wooden beams with galvanized staples, secured to the framing by being bent around it, if for iron beam-flange protection, or secured to the framing with galvanized wire where necessary. Where there are no beams to fasten the lath to, it is necessary to make a frame like that shown on Figure 132, and secure to the arch or framing every $4'\ 0''$ or $5'\ 0''$. For the better class of dwellings that are not made entirely fireproof, the ceilings should be lathed with wire-lath and plastered with hard plaster, as that gives the best results for finished surface and resistance to fire. Then they must have a deafening of mineral-wool or other material put in over, as these materials are very resonant. The second kind of metal-lath consists of sheets of about No. 26 metal crimped-up so as to form a series of dove-tails (Cornell's Metal Lath), or corrugated (Cincinnati Corrugating Company's), with perforations to make a clinch for the plaster. The corrugated lath is the best and where there are large flat surfaces to cover and the framing is spaced about $4'\ 0''$ on centres, it makes an excellent surface. It should be plastered with hard plaster.

§ 347. Cross-Furring: — For all ordinary work the lath or wire can be nailed directly to the beams, but where the ceilings are intended to be made perfectly flat so as to give them a high finish, either in plaster or paint, then the beams should be cross-furred with $1'' \times 2''$ spruce lath, with the lath so cut to the beams as to make the bottom surfaces of the lath all in the same plane. Cross-furring is desirable wherever there are cornices of more than $10''$ girt called for, as the ceiling must be perfectly plane to make a joint.

§ 348. Deafening: — Wherever hard plaster is used or noise is feared, deafening should be put in by filling over the



Methods of deafening.

Fig. 138.

top of the plaster with $2''$ of mineral-wool or by tacking strips to the sides of the beam with building-felt or paper interposed. (Fig. 138.)

[To be continued.]

OUR SENATORS AND OUR PUBLIC BUILDINGS.

[The following discussion which took place in the Senate on April 11, is fairly typical of the manner in which the building interests of the Government are cared for. An excellent example of the way in which these interests are made subservient to the expediencies of party politics can be found in the passage-at-arms between the Senators from Massachusetts and Missouri. — Eds.]

The *Vice-President.* — The Chair lays before the Senate the resolution of the Senator from Oregon [Mr. Dolph], coming over from a previous day, which will be read.

The Secretary read the resolution submitted by Mr. Dolph on the 6th instant, as follows:

Resolved, That the Committee on Public Buildings and Grounds, to whom was referred the bill (S. 65) to provide for the construction of a public building at Salem, Oregon, be, and is hereby, discharged from the further consideration thereof; and said bill is ordered to be placed on the Calendar for consideration by the Senate in its regular order.

Mr. Cockrell. — I should like to hear some reason why the committee should be discharged from the further consideration of the bill named in the resolution, and the bill be brought before this body for passage without any report and without any action of the committee? It is a very strange proceeding.

Mr. Dolph. — I am going to state the reason for the resolution:

Mr. President, I wish to disclaim any disrespect for or discourtesy to the Committee on Public Buildings and Grounds. So far as I know, there has never been any opposition in the committee to the bill referred to in the resolution, and there has been substantially no opposition to it in the Senate.

The bill referred to was introduced in the Fiftieth Congress; it was then Senate bill 21, introduced by me December 12, 1887, reported March 19, 1888, and passed the Senate April 17, 1888. It was not reported in the Fiftieth Congress in the House of Representatives. In the Fifty-first Congress the bill was again introduced by me; it was then Senate bill 78. It was introduced December 4, 1889; reported February 10, 1890; passed the Senate March 13, 1890; reported to the House of Representatives April 22, 1890. In the Fifty-second Congress it was Senate bill 534, introduced by me on December 10, 1891, reported January 12, 1892, and passed the Senate January 20, 1892. A similar bill was introduced by my colleague in the other House, and was reported in the Senate March 24, 1892.

The bill was again introduced by me on the 8th of August last, more than eight months ago, and was referred to the Senate Committee on Public Buildings and Grounds. It has not been reported by that committee at the present Congress. It will be seen that the bill has been, heretofore, three different times favorably reported by that committee, and has passed the Senate three times.

There have been seventy public-building bills introduced in the Senate at this session and referred to the Committee on Public Buildings and Grounds. None of them, I believe, has been reported, and what the committee proposes to do in regard to the reporting of bills for public buildings at the present session of Congress, or during the present Congress, I am not advised.

I do not propose to quarrel with the committee about any policy they may think it necessary to adopt in regard to the seventy bills providing for the erection of public buildings which are now before the committee. There are four bills relating to public bills in Oregon before the committee. One is to increase the further limit of cost of the public buildings at Portland, Oregon; another is the bill referred to in the resolution, for the construction of a public building at Salem, Oregon; another is for the construction of a public building at Baker City, Oregon, a bill introduced by myself, and reported favorably during the last Congress; and still another is for a public building at The Dalles, Oregon, introduced by my colleague.

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The bill which I have selected, with which to test the sense of the Senate, is a bill which has not only been three times favorably reported in the Senate and twice favorably reported in the House of Representatives, but has three times passed the Senate. Besides, it is a bill for the erection of a public building at the capital of the State.

The senior Senator from Missouri [Mr. Cockrell], when I was discussing the bill for a public building at Salem during the last session, said in the Senate — or if not, he said to me privately afterwards, I think he made the statement in the Senate — that the rule of the Senate had always been to authorize the construction of a public building at a State capital.

Mr. President, of course my constituents hold me responsible for the success of this measure, and for other similar measures which I have presented to the Senate.

The object of the resolution is to ascertain whether the policy of the Committee on Public Buildings and Grounds, which has been followed for the eight months since the bill referred to was introduced, is to be the policy of a majority of the Senate. I desire a vote of the Senate upon the resolution, without any desire to cast any reflection whatever upon the committee. I do not quarrel with any policy the committee may see fit to adopt owing to the condition of the Treasury or otherwise.

Mr. Vest.— Mr. President, this is an extraordinary resolution; and I ask the attention of the Senate to the statement I am about to make, as there are a great many of these bills authorizing the construction of public buildings pending before the Joint Committee on Public Buildings and Grounds of the two Houses of Congress.

When I became chairman of the Committee on Public Buildings and Grounds of the Senate, the Secretary of the Treasury, Mr. Carlisle, called upon the chairman of the Committee on Public Buildings and Grounds of the House and upon me, and requested, if compatible with our views of the necessities of the public service, we should not recommend the passage of bills which made original appropriations for new public buildings until the monetary depression, which was then threatening the country, should either pass away or its extent be ascertained. He apprehended then — and subsequent events showed that he was correct — a large deficiency in the Treasury of the United States, a deficiency which he afterwards estimated at $29,000,000, and subsequently at $76,000,000, and the extent of which to-day can not be definitely stated by anyone.

How long this is to continue, and what is to be the effect of legislation had by Congress in regard to taxation, no one who does not possess the gift of prescience can possibly state with any exactness to the country.

We know very well the condition of business; we know the condition of the Treasury; we know the financial uncertainty as to the future, and I perfectly agree with the Secretary of the Treasury that, until the clouds have passed away, until we can see our pathway with some sort of certainty, it will be reckless and almost criminal to pile up additional indebtedness when we do not know the sources from which the money can be had with which to meet it.

If the Committee on Public Buildings and Grounds had been guilty of discrimination against the bill of the Senator from Oregon, there would be some sort of pretext for his action here to-day. No bill for an original appropriation has been reported from that committee; no discrimination has been had. We are simply waiting to know what will be the financial legislation of Congress and the probable condition of the Treasury before we assume the pecuniary obligation which would arise from passing any of these bills.

There has been a rule adopted by our committee — and one which has my entire assent — that the capital of every State in the Union shall have a Federal building. It is just as certain as the existence of this Government, that the capital of Oregon will have a Federal building in the near future; but until we know how much money will be in the Treasury, until we can see our way, as any ordinarily prudent business man would in the transaction of his own business, it would, I repeat, be not only reckless, but almost criminal for us to pile up enormous indebtedness on this or any other account, unless it be absolutely necessary.

As to the public buildings which are in course of construction or for which Congress has already made appropriations, as a matter of course we are compelled to furnish enough money to preserve those buildings in their present condition, in order that the effects of the weather and the wear and tear will not destroy the investments already made in that regard by the United States.

Mr. President, I am glad that the resolution of the Senator from Oregon gives me an opportunity to make an official exhibit in regard to the condition of the public buildings of the United States, those already constructed and those which we propose to construct hereafter.

I have in my hand a paper sent to me from the Treasury Department by the Supervising Architect, giving the number of public buildings finished and paid for by the United States. They amount to 251 now completed, for which the Government has expended $109,798,187.97.

Mr. Frye.— What is the total number of buildings?

Mr. Vest.— The total number is 251, excluding the buildings in Alaska, which are inconsiderable in number.

I ask that this statement be printed as a miscellaneous document for the convenience of Senators.

The *Vice-President.*— Is there any objection to the request of the Senator from Missouri? The Chair hears none, and it is so ordered.

Mr. Vest.— Mr. President, now I come to a question more pertinent to the resolution offered by the Senator from Oregon.

I have also here a list of buildings now on the books of the Supervising Architect of the Treasury Department, embracing buildings not commenced and those in course of erection, giving the limit of cost under existing legislation, and the total amount appropriated. There are of those buildings in number 104, and I have a list of them in the respective States, with the limit of appropriation as to cost and the amount already appropriated. Congress has appropriated for the erection of these buildings the sum of $22,802,317.69.

Mr. Pasco.— Is that the amount appropriated or the limit of the appropriation?

Mr. Vest.— That is the amount appropriated.

Mr. Pasco.— What is the limit of appropriation?

Mr. Vest.— The limit of appropriation is $32,827,664.69.

I call the attention of the Senate to the fact that we have 104 buildings, some of which have been commenced and some of which have not been commenced, for which the Government has already pledged its credit to the amount of $32,827,664.69. Is it prudent, is it safe, with this enormous indebtedness already incurred by us, and the money — it is true not taken out of the Treasury, but liable to be taken out at any time — to rush blindly forward, without any immediate and actual necessity for it, in a time of the greatest possible distress, governmental and personal, to make appropriations until we have ascertained the exact policy and resources of the Government in the near future? That is the whole of this question.

Mr. Dolph.— Will the Senator have that statement published with the other?

Mr. Vest.— Certainly. I shall ask that this statement be published as a separate document.

Mr. Dolph.— Will it not be better to have them published together?

Mr. Vest.— Very well, let them be published together.

The *Vice-President.*— Is there objection to the request of the Senator from Missouri? The Chair hears none, and it is so ordered.

Mr. Vest.— Let me say to the Senator from Oregon that the claims of his State will be fairly and equitably met. There has been no discrimination on the part of our committee, and no such intention. I know but one rule in regard to my public action, and that is to conduct the business of this Government, its importance and magnitude considered, upon the same principles of prudence and discretion which I would apply to my own. If I found myself in embarrassed circumstances, with a limited amount of money at my command, and contemplated the erection of a residence or a business house, and a great panic like that from which the country is now suffering should come, I should consider myself unworthy of the name of a prudent business man if I rushed on blindly and incurred obligations which I saw no immediate chance of meeting.

If the Senator from Oregon will but wait, it is the intention of the committee, as soon as we find out exactly how much money we are to raise and what is the condition of the country and the Government financially, to meet the demands for other public buildings, and in the meantime, at all events, to preserve those buildings which are now in process of construction and to redeem the promise of the Government as to appropriations already made.

Mr. Frye.— Mr. President, I call the attention of the Senator from Missouri to the promise he makes to the Senator from Oregon, which may not be acceptable to that Senator, and that is, that justice, and only that, shall be done to the State of Oregon. With the persistence, energy, and determination of the Senator from Oregon in behalf of appropriation for that State, if the Senator from Missouri succeeds in preventing the Senator from Oregon from getting more than twice what justly his State may be entitled to, he will be smarter than I think he is. [Laughter.]

Mr. Dolph.— Mr. President, I of course duly acknowledge and duly appreciate the compliment intended to be paid to me concerning my energy; but I think the Senator from Maine is doing me an injustice. I never ask anything but justice, and the Senator from Missouri will bear me witness that I did not complain of any discrimination by the Committee on Public Buildings and Grounds. I stated that there were seventy bills before that committee for public buildings, and I procured copies of them in order that I might know that fact. I have been treated precisely like the Senators who introduced those seventy bills. I said it was simply a question of policy, and all I desired to ascertain was whether a majority of the Senate agreed with the majority of the Committee on Public Buildings and Grounds that all appropriations for public buildings must for the time being be stopped.

I ask for the yeas and nays on the resolution.

Mr. Quay.— Before the question is put, as a member of the minority of the Committee on Public Buildings and Grounds, I think it proper to mention that I agree with the policy adopted by the committee, and do not believe that committee should be discharged from the consideration of this bill. There is certainly no reason why a discharge should be effected such as that proposed by the Senator, which would not apply to almost every one of the public building bills before the committee.

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I assented to this policy, Mr. President, because in view of the imbecile financial management of the present Administration, the apparent inability of the majority in the other House of Congress and in this to get together upon any satisfactory financial agreement, and the probable passage of what is known as the "Wilson tariff bill," I believe there will be a vacuum in the Treasury, and it will be safer not to go forward with any new public improvements, but to husband our resources for the protection of those already in the course of construction; in other words, that we should not load up a probably bankrupt treasury with appropriations not certainly necessary.

I shall, therefore, vote against the resolution of the senator from Oregon.

Mr. Vest.— I wish to make one statement somewhat personal to myself and simply to accentuate my sincerity in what I have stated.

There are three towns in the State of Missouri, all equally anxious for the erection of public buildings, and their people consider it a great outrage that such buildings have not been commenced. At a former session of Congress, bills were passed for the erection of those buildings. Under existing circumstances, I have declined to reintroduce those bills. I have stated to my constituents frankly the condition of the Treasury, and that I could not, with my views in regard to official duty, ask Congress under the circumstances to enter upon new appropriations.

In addition to that, there is a public building now being erected in the city where I live. I have not asked any additional appropriation to carry on that work. I simply mention this to acquit myself of having any selfish or sinister design or object, either now or hereafter, in regard to this matter.

The *Vice-President.*— The question is on agreeing to the resolution proposed by the Senator from Oregon.

Mr. Dolph.— I ask for the yeas and nays.

The yeas and nays were ordered.

Mr. Morrill.— I think the pending resolution had better be referred to the Committee on Public Buildings and Grounds. At the last meeting of the committee we were not able to have a majority present; but I think it was very clearly indicated by those present that before the adjournment of the present Congress there will be appropriations for buildings at the capitals of States which have not buildings already, and also for buildings in process of construction where further money is necessary to complete them. I, therefore, move that the resolution be referred to the Committee on Public Buildings and Grounds.

Mr. Pasco.— Mr. President, I was a member of the Committee on Public Buildings and Grounds during the extra session of Congress, and for the most part of the present session, although I am not now a member of that committee, and I rise to state that I agree entirely with the views expressed by the chairman of the committee.

There are two buildings in my own State in which we are very much interested, and bills for their erection have passed the Senate at previous sessions; yet the committee has taken no action whatever, either favorable or unfavorable, with reference to those buildings simply because of the existing condition of the Treasury.

There has been no disposition on the part of the committee to discriminate against the Senator from Oregon, and I think if the list of the public buildings now in process of erection had been read through, it would have been seen that Oregon certainly has secured her share, if not more than that.

Under these circumstances, I shall be compelled to vote against the resolution. Oregon has been treated as fairly as any other State, and the Senator from Oregon has been treated with the same courtesy that other Senators have been.

Mr. Cockrell.— The Senator should vote, then, to have the resolution referred to the Committee on Public Buildings and Grounds.

Mr. Vest.— I thought the motion was to discharge the committee from the further consideration of the bill referred to by the Senator from Oregon.

Mr. Cockrell.— The Senator from Vermont [Mr. Morrill] has moved to refer the resolution to the Committee on Public Buildings and Grounds, and that is the pending motion.

Mr. Pasco.— I did not understand that to be the motion.

Mr. Dolph.— On that motion I ask for the yeas and nays.

Mr. Bate.— We do not understand in this part of the Chamber what is the proposition under consideration, whether to discharge the committee, or to refer the resolution.

The *Vice-President.*— The Chair will state the condition of the question. The question is on the motion of the Senator from Vermont [Mr. Morrill] that the pending resolution be referred to the Committee on Public Buildings and Grounds. Upon that motion the Senator from Oregon asks for the yeas and nays.

The yeas and nays were ordered.

Mr. Allen.— Mr. President, I am not usually in very hearty accord with the ambition of the Senator from Oregon, especially upon the question of appropriations; but there is a principle involved in his motion which I think ought to be considered by the Senate.

I say, with all due respect to the Senate and its rules, that in the year I have been here I have been constantly impressed with the thought that the rules of this body are so constructed as to impede rather than to facilitate the public business. A bill introduced in the Senate, when it once leaves the hand of the Senator who introduces it, passes hurriedly into the possession of the committee organized to receive it. That committee very rarely, if a majority of it are against the measure, report it or report progress upon it until they are called upon by a resolution such as the Senator from Oregon has introduced in this case.

I have introduced a number of bills, which to me, at least, have some importance, whether they have to other Senators or not. Those bills have been referred to committees, and I suppose pigeonholed months ago. I have never been able to obtain thus far even an unfavorable report upon them, so that I might have an opportunity to place the bills upon the Calendar with the unfavorable report attached, to the end that they can be considered by the Senate. These bills seem to be suspended in the air. There is no possibility of getting a favorable report and no possibility of getting an unfavorable report; but the purpose seems to be to have them die a quiet death in the pigeon-holes of the committee-room, so that the country will not know what has become of them.

While I say that ordinarily I should not be in sympathy with the motion of the Senator from Oregon, I am in favor of it in this instance, because I want to see the rule introduced here of reporting some time in an ordinary lifetime upon bills that may be introduced and referred to committees.

Mr. Dolph.— I wish to say again that the purpose of this resolution is not to gain advantage over any other Senator or over any other public building bill. It is simply to get a vote of the Senate to see if a majority of the Senate approve of the policy of the committee.

Mr. Hoar.— I was sorry to hear the announcement of the policy of the committee by the Senator from Missouri, and I hope Congress will proceed in its ordinary way, providing for the public wants and the reasonable expenditures of the Government. I am sorry that that Senator seems to think that the mischievous schemes which he is supposed to be favoring, and is to some extent the father of, are going to keep the country in its present condition for a long time. I suppose these public buildings will not be built by very large expenditures during the present year. It takes some time to get the designs from the Supervising Architect, some time to purchase the land and to agree upon the site. I think we had better act as if we all hoped and believed that the threats which are now filling the people of the country with alarm will soon pass by, and we had better legislate as if the country was going to recover its accustomed prosperity very speedily.

Mr. Vest.— It is absolutely impossible for the Senator from Massachusetts [Mr. Hoar] to discuss any sort of measure here without injecting his partisan feelings and opinions. The "mischievous schemes" which I am advocating could be very well discussed when the tariff bill comes before the Senate. Everybody who knows the Senator from Massachusetts knows that no rules of the Senate will insure his silence upon that or any other question. When the tariff bill comes up for discussion I shall be very glad to discuss the question submitted. I care nothing for that sort of talk.

I wish to say, in answer to the Senator from Nebraska [Mr. Allen], that he seems to be under the impression that there is a system of stifling legislation going on in the Committee on Public Buildings and Grounds and other committees. He is very much mistaken.

We do not wish to report against these public buildings. We have an indebtedness of $32,000,000 now upon us, and we simply want to wait to see what will be the financial legislation of Congress, which will very soon be determined, and what will be the financial condition of the country, in order to decide whether we shall recommend so many buildings equitably distributed amongst the States and with a view to their importance and need in the respective States. That is all. Does the Senator want us to report the bills back now without recommendation, or adversely? We are unwilling to do that. There is no great necessity for these buildings and the country will not suffer because they are not commenced. We are now trying to complete those which we have commenced.

If the doctrine advocated here to-day, or which seems to be advocated, should prevail, we should go on and make appropriations without looking at the condition of the Treasury, without considering the probabilities of the future, and pass every bill which has an appropriation in it. I do not understand why we should do that, and I shall certainly not act upon any such assumption or argument.

I hope that the motion of the Senator from Vermont will prevail.

Mr. Hoar.— I wish to remind the always garrulous and voluble Senator from Missouri [Mr. Vest], that the form of argument which he himself says ought not to be introduced was introduced by him. It was he who suggestad that the Senate could not go on with the ordinary provisions for the convenient transaction of the public business, because of certain very painful and disturbing conditions of the public finances. I observed in answer to that, only that I thought those conditions would pass away. I had said nothing about the tariff, and the Senator, like a small boy who is defeated in a contest, runs off and hurls back a personality as he disappears.

Mr. Peffer.— While this subject is before the Senate, I wish to again call the attention of the Committee on Public Buildings and Grounds to the fact that there is a resolution now before that committee, referred perhaps five months ago, in relation to the backwardness of work in the Supervising Architect's office, where they are several years behind as to some buildings, and especially as to one in the State of Kansas, where they are some five or six years behind in the matter of preparing designs and specifications for the building, for which appropriations were made long ago. I think if the committee would exercise a spirit of inquiry in that direction, perhaps

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some good would result from it; at any rate, I think it would help us a little in our part of the country.

Mr. Vest.— I wish to say, in reply to the Senator from Kansas, that the matter to which he refers is under consideration by the Supervising Architect and the Secretary of the Treasury. I have had interviews with them and correspondence with them. The difficulty seems to be in regard to the method by which relief can be given to the Bureau of the Supervising Architect. It is a mere question of method and of detail. I agree with the Senator from Kansas that that Bureau should be thoroughly reorganized. There is a joint committee now at work, appointed by the two Houses of Congress, to investigate the methods of business in the Executive Bureaus and Departments, and we have been awaiting their report, especially upon the Supervising Architect's Bureau, hoping that we could agree in regard to the remedy that should be applied.

Mr. Peffer.— I am very glad to hear it.

Mr. Vest.— As soon as possible that matter will be attended to.

So the resolution was referred to the Committee on Public Buildings and Grounds. — *Congressional Record.*



THE LATE W. F. POOLE, LIBRARIAN. — STRIKES. — THE PLUMBERS DEMANDS. — BIDS FOR THE WORLD'S FAIR BUILDINGS. — MOVING THE "*Illinois*." — CONDITION OF THE COUNTY BUILDING. — EXHIBITIONS.

SINCE the writing of last month's letter, Chicago has suffered a great loss in the death of Dr. William F. Poole, Librarian of the Newberry Library. Dr. Poole, as is well known, had a wide reputation as the originator of certain reforms in interior library construction as opposed to the "stack" system, a relic of old monastic and ecclesiastical libraries quite unsuited for our present kind of buildings with their excessive steam heat. Mr. Poole's ideas have had a great influence in library construction all over the country, and even when this influence was denied recognition, it is easily recognized. In the Newberry Library this arrangement of books has been carried out, and it is entirely practical to combine these ideas with successful architectural features. Mr. Poole was a man of wide culture and broad ideas, and in his death the Association of Librarians, as well as the public in general, has sustained a loss that will not soon be filled. The Orington Law Library, of the North Western University at Evanston, now nearing completion, is another structure into which his ideas are to a large extent incorporated.

As usual, as spring makes its advent, strikes become the order of the day. At the present writing a strike among the brickmakers is pending, though it is unsettled whether it will be declared "on" or not. The chief demand is on the matter of wages, but, unfortunately for the success of the enterprise, the owners of the yards say that, with the present small profit in the business, they themselves are indifferent as to whether they are able to keep the yards open or not. Consequently the cinch which the strikers in this case have on the proprietors is of a decidedly flexible nature. A strike of much larger proportions and stronger nature is declared "on" among the painters and paper-hangers. In the first days of the month, four thousand men left the ranks of the workers. A representative of one of the largest firms in the city is reported as saying that a cut in wages from the present rate was intended and that the minimum rate of thirty cents an hour was all that the present condition of affairs would warrant, that a general shut down seemed inevitable, and that the prospects were for a long lock-out. On the same day on which the painters and paper-hangers struck, nearly two thousand plumbers joined the ranks of the discontented, the men claiming they must have $3.75 a day while the bosses are willing to pay $3.25, and insist that the men shall buy their own furnaces, at a cost of seven dollars. The claims made by the Master Plumbers' Association are as follows, and on the bosses refusing to accede to them a general strike was declared. Section first concerns the hours of labor:

"The hours of labor shall be from eight A. M. till five P. M., with "one hour for dinner, except Saturdays from June 15 to September "15 when the hours of labor shall be from eight to twelve.

"The wages shall be $3.75 a day, excepting Saturdays, when they "shall be $2.25.

"Wages are due and payable when work ceases on Saturday.

"All Sundays and holidays and overtime work shall be paid at "the rate of double time. Meals shall be furnished by employers "for any man who works two or nine hours overtime.

"Any man reporting for work who has not been laid off previously "shall receive no less than one-quarter day's pay.

"Car-fare shall be paid to and from job by employer, where distance "is more than one mile from shop.

"The members working outside the city of Chicago shall be sub-"ject to all the conditions of this agreement, and in addition thereto "shall have their board and railway tickets furnished, travelling "time paid at rate of regular time; when travelling at night, sleeper "to be furnished where distance is more than one hundred miles; no "charge for said time; Sunday travelling to be paid as single time.

"That all men shall be held responsible for their work when it is "due to their negligence and other causes traceable to their careless-"ness and incompetency.

"That whenever a question shall arise between the employing "plumber and the employed, in regard to inferior work done by said "employé, and said question cannot be settled by said parties, then "an arbitration committee shall be appointed, consisting of two "members, one to be selected from the Master Plumbers' Associa-"tion, and the other by the Journeymen Plumbers' Association, and "in case said committee of two cannot agree, then said committee of "two shall select a third party, and the decision of the majority of "said committee of three shall be final and binding upon both "parties."

These are not all the items in the compact drawn up, but are the sections of most importance, and it really seems to leave little to desire on the part of the men. Of course, each side claims that the other is going to give in and, indeed, it does not now look as if a prolonged struggle would be the outcome of the demands.

Since last month bids have been received by the Jackson Park Commissioners for the World's Fair Buildings. The difference in amounts offered was a surprise to all concerned, as well as the number of bids — nineteen in all — which were made. The most striking feature of the whole thing is the difference of the amounts now offered for the buildings, with what was the original salvage calculated on them. The principal bids were: World's Fair Wrecking, Salvage, and Warehousing Company, $21,202.00; the Globe Wrecking and Salvage Company, $15,160.00 for ten buildings; the Block-Pollak Iron Company, $15,025.00, for the Agricultural, Transportation, Electrical, Mines and Mining Buildings and Machinery Hall, and Dion Geraldine offered for the Manufactures Building, $10,000. None of these bids, however, were satisfactory to the Commissioners, being much lower than what they had decided the buildings to be worth.

On April 7th, however, the South Park Commissioners completed a private sale, by which all of the principal buildings of the Fair went to a St. Louis firm for $75,500. The Manufactures, Administration, Electricity, Mines, Agricultural, Fishery and Transportation Buildings and Machinery Hall were all in the purchase. In fact, the Art Building and the Forestry, together with the Convent of La Rabida, were the only buildings of any importance not included in the sale. The work of demolishing the structures will be begun at once. [This sale, too, has been cancelled by the Park Commissioners. — EDS.]

The most interesting feature in the matter of removing any of the structures which once belonged to the Fair will be that connected with the mimic battleship "*Illinois*," which last summer, resting securely on brick and pile foundation, constituted the unique naval exhibition by the side of one of the long piers. The "*Illinois*" is destined to be the new home of the Naval Reserve, an organization which has had a short but flourishing existence here in Chicago. This Reserve is the naval part of the State Militia and, consequently, in a measure under United States protection, which was sufficient reason for the Government presenting the battle-ship to be used as the home of the body. It is intended to remove the "*Illinois*" from its present position at Jackson Park to a point several miles farther north, opposite the Lake Front Park and behind the Government breakwater. The account as given by the Chicago *Tribune* in an interview with F. W. Grogan, the naval architect who has charge of the undertaking, was most interesting. That the magnitude of the enterprise may be better appreciated, the *Tribune* gives a description and the dimensions of the "*Illinois*," which, though familiar to many, are easily forgotten. The ship is the size of the new steam-ship "*Indiana*," being three hundred and forty-eight feet in length. It is about sixty-nine feet wide amidships, and from the water to the main deck is twelve feet. On this deck is a superstructure eight feet high, with a hammock berthing on this seven feet high, while still above is the bridge, chart-house, and the cone-shaped tower called the "military mast," which makes the distance from the water to the top of this mast seventy-six feet. Mr. Grogan says, "I now feel absolutely sure of the success of the plan, provided, of course, no unforeseen circumstances arise, such as a sudden storm of extraordinary violence, for instance.

"How do I propose to move the '*Illinois*'? Just as soon as I can do so, I shall begin on the foundation at the foot of Van Buren Street. This foundation will be made to last and to withstand the assaults of wind and wave. To prevent disintegration from the action of the elements, I shall make a composite foundation: all material under the water will be of wood, and all above the water-line of brick, concrete or possibly granite. The latter would be best, of course, but it is expensive, and I shall probably conclude to follow the example set in the construction of the present foundation and use brick.

"The plans show that the wood portion of the foundation is to be of piles, well driven and tied with heavy cross timbers or caps and the stringers running fore and aft form a longitudinal tie, and at the same time serve the purpose of a bed, upon which the brick portion of the foundation is to be built. Sheet-piling is driven around the periphery for stiffness and to prevent the action of waves under the structure. These brick walls are about three feet high; the inside

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wall about thirteen inches and the outside wall three feet thick. The brick at the outside of the periphery will be given shape to the line of the foundation by being laid as stretchers, fore and aft, as a tangent to the curve or contour of the hull; also 'stepped' to give 'tumble home' or batter to the sides and ends. The walls will also be anchored, or rather tied to the stringers, by iron rods passing through them, and set up with nuts upon iron plates or washers on top of the brick walls. For a width of twenty-six feet in the centre, and running the whole length of the foundation, a clearance space will be left unfinished for the passage of the pontoons that sustain the central portion of the structure during transportation. Inside this space the pile heads will be cut off and capped with timber below water of sufficient depth to permit the floating of pontoons over them.

"Coming to the moving of the structure, the first thing to be done will be the preparing for the arrangement of thirteen pontoons, or floats, by whose aid this work is to be accomplished. The ship, at present, rests upon a foundation of piles and heavy timber. The berth and lower deck rest on top of this foundation and is about four feet above the average water-level of the lake. Finish was given to the outside of the hull at the sides of the foundation by iron plates fastened to sheet-piling driven about the periphery. These plates extended well below the lowest water-level. It is the intention to raise the superstructure and all the foundation, except the piles, and deposit it upon the foundation of the new site. There are about six hundred and eighty-five piles, besides the sheet-piles at sides, from which the structure is to be separated. There is not sufficient depth of water under and about the ship to float the pontoons, and it will, therefore, be necessary to dredge on the outside and to either 'suck' or 'jet' the sand from beneath the foundation until the required depth is attained to float the pontoons to their requisite position about and beneath the structure. A portion of the present protective pier will be torn away, also, for this purpose, but the break-water protection will be left until the ship is in readiness for her trip.

"In order to equally distribute the bearing power of the structure upon the floats, it will require about thirteen scows, each of which is eighty feet long, twenty-four feet wide and six and a half feet deep. The draught of water of the scows when light is about twelve inches, which leaves about five and one-half feet free-board (the distance from water-level to rail) to work upon. This is equal to a displacement of over three thousand eight hundred tons, which is about two and two-thirds times more displacement than is needed to carry the weight of the ship. There will be three lines of scows, one on each side and one in the centre of the vessel. To get this central line of scows under the structure, it will be necessary to cut away three rows of piles the whole length of the ship, thus leaving hanging a space of about thirty-two feet in width. Previous to the cutting away of these piles, however, the ship's decks at this part will be temporarily trussed by placing heavy timber on top of the berth-deck, reaching across this span, and tied by rods to the beams of the foundation. The ends will be further supported by using the military mast for a ring-post, and running iron rods from the top to a timber lashed beneath each end of the ship.

"The floats being in position, we shall make practically three solid pontoons by securing them together with timbers, fastened by screw-bolts. Pipes will encircle the pontoons, with branch pipes leading into each float, and connected to powerful steam-pipes for filling and pumping out the water from the floats when desired. The pontoons will be sunk by filling with water until there is only about three inches of free-board. Trusses or timbers will be placed under the foundation, running crosswise the vessel from one pontoon to another, the ends of which rest upon blocking built up from scows.

"Everything being in readiness to raise the vessel off the pile-heads, the pumps will be started to relieve the water-ballast from the pontoons until enough water has been pumped out of them to equal the weight of the structure, which is one thousand six hundred tons, or about two and one-half feet in depth of water. As the pumping of the water from the scows progresses, the strain upon the timbers supporting the vessel becomes gradual, until the water relieved from the scows equals the weight put upon them.

"The '*Illinois*' now being ready to start on its first voyage, all that remains to be done is to tear away the outer end of the break-water for egress to the open Lake. For transporting it will require about three tug-boats besides one tug-boat aft to steady or help steer the mass *en route*.

"It will probably take about three hours to make the trip, and by making an early morning start there is no reason why the transporting and settlement of the structure upon its new foundation cannot be accomplished before sundown of the same day. Upon arriving at its destination, the ship will be floated over the new foundation which will be so constructed as to permit the passage of the floats as before described. When she is in the right position, the pontoons will be settled by filling with water until the vessel comes to her bearings upon her new resting-place. The pontoon timbers and blocking will then be removed, and the uncompleted foundation be finished, the ends of which will be done by sinking cribwork filled with stones, and the setting of a row of cast-iron pillars through the centre for the support of that portion of the structure."

While the Board of Trade is being dismantled of its dangerous tower, another building in the city is threatening the lives of its occupants with instant and sudden death. This is the County Building, where weak construction and general settling has caused dangerous results. In one of the court-rooms a heavy ceiling weighing twenty-five thousand pounds fell during this last month, fortunately however choosing the opportune time of four A. M. to do so, thus averting what might have been a most disastrous catastrophe. The architect of the building lays the accident to the fact that the building has settled badly and unevenly, and he considers that the ceiling itself was constructed as it should have been. One of our most prominent architects has been called in for consultation with the present county architect. In one of the judge's room the iron brackets supporting the heavy cornice have started away from the walls in many places, and examinations are being made as to the ceiling of this room, especially in regard to the stability of the floor arches of the floor above. In still another of the court-rooms there is a bad crack over one of the entrances, and still another over one of the windows, and what is most alarming, these cracks go through the hall and outside wall, the entire width of the building from Clark Street to the court-room. Several other cracks have appeared in other parts of the building, and orders have been given to have levels taken around the structure, and excavations made at the foot of the southeast pier of the foundation, where the worst settling is supposed to have occurred, so as to ascertain the condition of affairs in that quarter.

These old buildings which were erected before the matter of foundations for large structures was entirely understood, of the system completely developed, are a constant source of danger and annoyance, and as soon as they all disappear from the community, just so soon will a dangerous feature be removed from our daily life.

At the Art Institute the spring water-color exhibition is now being held and, as usual, this is one of the most interesting exhibits of the year. There has just closed an exhibition of one of the local art clubs, this time the Cosmopolitan, which was one of the strongest ever made here in the city. Such strides has local art taken within the last few years, that could all these clubs, three or four in number, combine in one annual exhibition to display their best and strongest work, there certainly could be made a very creditable showing. The Cosmopolitan exhibition contained many more pieces of work of a pretentious nature (we do not use the word in any derogatory sense) than is usually found here in an exhibit of the local clubs. In fact, there is less of the sketch element and more actual pictures. Some especially strong work is displayed by the sculptors who are members of this club.

The Chicago Society of Artists and the Architectural Sketch Club have combined to form a new home, having rented one of the old houses on Michigan Avenue. The societies intend renting out studios in the building to help defray the expenses of the place, and the old barn of the place is to be turned into an exhibition-gallery.

The Architectural Sketch Club is soon to hold an exhibit at the Art Institute, which will be an innovation in the usual class of exhibitions held there, inasmuch as it will be purely architectural in character.



CANADA

CONTRACT TAKES PRECEDENCE OVER GENERAL CONDITIONS: CASE OF THE TORONTO COURT-HOUSE CONTRACTOR. — PROPOSED FORMATION OF A BOARD OF CONCILIATION FOR LABOR DISPUTES. — NIAGARA FALLS WATER-POWER.

A DECISION of great importance to architects and contractors (against which, however, an appeal will be taken) has recently been given by Mr. Justice Rose at Osgoode Hall, Toronto, in the case of Neelon *v.* Lennox. The decision is to the effect that where a "contract" and "general conditions" conflict, the "contract" governs, and must be taken as binding. This case is the outcome of proceedings which terminated, at the time, in the dismissal of the contractor of the new Toronto Court house, accounts of which have appeared in these letters eighteen months ago. In this action, Captain Neelon, the contractor, sued the architect, Mr. E. J. Lennox, and the city. The defendant was represented by Dalton McCarthy, Q. C., G. T. Blackstock, Q. C., and Messrs. Monro Grier and W. B. Chisholm; while on the plaintiff's side were S. H. Blake, Q. C., and Messrs. Walter Cassels and M. A. Piggott. A large number of witnesses had been subpœnaed by both parties. The case was opened on behalf of the plaintiff, Captain Neelon, by Mr. Cassels and Mr. Blake. They began by reciting the statement of claim: On July 27, 1889, the contract for the new Court-house was let to Captain Neelon and John Elliott of Brantford (the latter having since died). The work under contract did not begin regularly until April, 1890. The specifications called for Credit-Valley greystone and New Brunswick stone. The amount of the contract was $838,061.47. Under the conditions of the contract, the architect had power to dismiss the contractors, in case the work was not carried on with promptness, and with such materials and workmanship as the architect deemed

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necessary. A further provision was made to the effect than in all disputes the architect's opinion was to be final. The contractors made arrangements for delivery of the stone from the quarries and during 1890, 1891 and 1892 about $60,000 worth of the New Brunswick stone was delivered from a quarry at Wood Point, New Brunswick. In June, 1892, Mr. Lennox, the architect, condemned some of this stone that had already been built into the wall some time, because it was weathering badly. The plaintiff, at first, refused to remove it, stating that it had been previously passed by the defendant, but finally agreed to remove portions of it, and requested the City-council (the proprietors) to investigate the dispute. In July, 1892, the architect ordered the plaintiff to put on an additional force of 190 men within ten days, declaring that the work was not making satisfactory progress, and that the contractor must also supply more material in accordance with the contract. In default of this he would be dismissed. At this time Mr. Kivas Tully, Provincial-Government Architect, and Mr. Langley, architect, were making an investigation of the stone on behalf of the contractor, and he applied for and obtained an interim injunction, restraining the architect from taking the step of dismissal of which he had given notice. On July 21, 1892, the plaintiff agreed to remove all the stone the architect objected to personally, but he did not remove it and considerable delay followed. Another notice was served on the contractor in August, to the same effect, ordering additional workmen and the supply of the requisite material, dismissal being threatened if the order was not complied with. On September 8th following the contractor was dismissed. At midnight, the architect, who had been prevented by the contractor from entering on the works, went to the building with a couple of policemen for his protection. Having climbed the fence, he admitted the police, and finding only a couple of watchmen turned them out, but reinstated them directly as caretakers in his employ. By an order of the Court, the city was then given possession of the works and permitted to continue them by day-labor.

The plaintiff, in this action, claimed that the notice of dismissal was insufficient and not in conformity with the contract; that the consent of the City-council was necessary to the architect before he could take action, and that the architect, in dealing as he had done with the contractor, was actuated by unfair and malicious motives. The plaintiff sued for the dismissal of the architect, the appointment of another in his stead, for his reinstatement as contractor and for damages. The defence was that the stone was not according to contract; that the *contract* gave the architect the power to dismiss the contractor, but that the "*general conditions*" of the contract left this power in the hands of a committee of the City-council. The defence claimed *that the contract should take precedence over the general conditions*. On the second day's proceedings, Mr. Blake, counsel for the contractor, was arguing that the plaintiff was pushing on the work with all possible speed, but that it was impossible to obtain the required quality of stone. Mr. McCarthy, counsel for the architect, objected and contended that the city (as proprietor), had nothing to do with the difficulties of the contractor. Upon this a long argument followed, in which the defence brought up and argued the principal point in their statement of claim, which was as above stated, that although the general conditions gave the power of dismissal to the Court-house Committee of the City-council, the contract vested this power in the architect, and it was shown that the City-council, after the seizure by the architect, ratified and conformed his action.

On this point the judge reserved judgment till the next day, but when the court reassembled he said: "I think the architect was not "bound to have the consent in writing of the Court-house Com- "mittee, prior to serving the notice dismissing the plaintiff. If the "decision of the architect, as to the quality of the stone, was within "the powers conferred by the contract, and was right, it seems to "me that it is not of moment to inquire what motive influenced "the architect in determining according to the right. If he ex- "ercised his judgment with reference to the material and deter- "mined properly that it did not answer the contract, the decision "cannot be interfered with. It, therefore, is manifest, as it seems "to me, that the plaintiff must demonstrate beyond controversy, "that when the architect decided that the stone did not answer the "contract, such decision was wrong. If I cannot say that it was "wrong, I cannot say that it was fraudulently wrong, and the "plaintiff must fail, whatever view I might possibly form upon any "evidence tendered to show malice or ill-will. If the plaintiff is "to make out that the decision of the architect was not only wrong, "but fraudulently wrong, I do not see any object in receiving evi- "dence of fraud until I am satisfied there was error, and I do not "see how I could determine that there was error in judgment if "there was evidence upon which the architect might have acted, "and might properly have found as he did. If what the architect "did was within the scope of his powers, it must, I think, be "assumed that he was acting in the exercise of such powers.

After the delivery of this judgment, a long technical argument followed as to the procedure for an appeal, of which Mr. Blake gave notice. Mr. Blake wanted the suit adjourned, pending the result of the appeal, but Mr. McCarthy pressed for the continuance of the case, and that the evidence should be taken with regard to the stone and the motives that led the architect to reject the material. Mr. Blake demurred, and said they were not prepared to go on with this part of the suit. Mr. McCarthy at length asked that the case be dismissed, unless the plaintiff was prepared to go on. Mr. Justice Rose then dismissed the case. The appeal will be made at the next sittings of the Chancery Divisional Court.

It is stated that the Ontario Provincial Government has in contemplation a bill for the establishment of Boards of Conciliation, whereby labor disputes may, if possible, be settled, without resort to the trade-ruining strike which is the usual result of a disagreement between masters and men. There is a Provincial Act entitled "The Trades Arbitration Act," now forming Chapter 140 of the Revised Statutes of Ontario, which authorizes the formation of elective Boards, of employers and workmen in equal numbers, and after evidence has been taken by these Boards, the judgment given is final and conclusive. But, strange to say, this Act is rendered nugatory in nine cases out of ten by Section No. 28, which declares that nothing in the statute shall authorize the Boards to deal with disputes as to wages, wages being the very point about which nearly all disputes arise — the Act has remained a dead letter, and has never once been acted upon. The proposed legislative measure is intended to cover the ground that is prohibited in this Trades Arbitration Act, while at the same time it will probably deal with all cases, such as would be likely to result in strikes, and the experience gained since the passing of the above Act will be utilized to simplify the system. The new bill ought to be a valuable addition to the Provincial Statutes.

It does not seem very long ago, that the idea of utilizing the power of the Niagara Falls for the driving of machinery was looked upon as a "wild-cat" scheme and the notion struck horror into the hearts of scenery-loving visitors, who pictured the sides of the gully denuded of trees, and their places taken by factories clinging to the face of the rock, crowding as near as possible to the edge of the stream to take advantage of the force of the waterfall: while the more enlightened and practical among them considered it a matter of impossibility to "harness Niagara." Engineering science, however, has surmounted all difficulties and the water-power of Niagara has actually been made to turn prosaic wheels. Whether the result will be that hundreds of mills will be built, so as to spoil the magnificent scenery, must be left to the future, but sufficient precaution has been taken by the Canadian Government to prevent anything of this kind happening on its side of the gorge, all the land having been expropriated and turned into a National Park. A short time ago a test was made of the great hydraulic tunnel that has been driven from the back of the falling cataract; the great turbines were used for the first time and were reported to be thoroughly satisfactory and to have worked with smoothness and regularity. It would be difficult to say what will be the end of such a scheme. Fabulous sound the figures that are said to represent the power. Miles and miles of mills might be constructed and take their fill of the power, and yet leave plenty for miles and miles more. This is the beginning of a new era for the town of Niagara. Will it become a great workshop for the world?

BOOKS AND PAPERS

A DISTINGUISHED company, indeed, graces the feast to which the publishers of "*Les Artistes Célèbres*" now invite us — soldiers such as Gustavus Adolphus, Ernest of Mansfeldt, and Maurice of Nassau, statesman and patriots like Jan van Oldenbarnevelt, the Swedish chancellor Oxenstiern, and Admiral Coligny, and other famous personages, noble either in rank or soul, among them Elizabeth of Bohemia, "the Queen of Hearts," her husband Frederick, and her gallant champion, Christian of Brunswick; and handsome George Villiers, Duke of Buckingham, the favorite of "the English Solomon," in his wide lace collar and "great and manifold ropes and knots of pearl." The portraits of these notabilities, with others painted by Mierevelt, and engraved by his son-in-law, Willem Jakobsz Delff, dignify the pages of M. Henry Havard's book on "*Michiel van Mierevelt*," the latest issue of the series of artist-biographies which comes from the Librairie de l'Art of Paris. Van Mierevelt, an eminent artist who is said to have painted a greater number of portraits than any other of his countrymen, was born at Delft in 1567, and died in his native city in 1641. Quite apart from any fame due to his high talents, he linked his name indissolubly with that of some of the great ones of history by the fact of having painted their portraits, portraits accepted as the most faithful copies of their outward aspect.

THE same House also sends us a good photogravure of a painting by the Misses Desliens, which bears the title of "An Excellent Pot-au-Feu," and shows a pleasant-faced priest watching with interested mien the movements of his elderly housekeeper as she stirs the savory compound. The figures are painted with much truth of characterization, and the accessories give evidence of great care in their execution.

WHEN the first Part[1] of Mr. Bancroft's elaborate attempt to describe the late World's Fair and its results appeared, we were disposed to

[1] "*The Book of the Fair*," by Herbert Howe Bancroft, published in twenty-five Parts at $1.00 per Part, by the Bancroft Company, Chicago.

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feel that it might turn out a worthy monument of the great undertaking, but the succeeding Parts as they appear convince us that its true characterization must be that of a monument of misdirected effort. As a "popular" affair — one to be sold to the people and kept as a show-book in the locked-up New England parlor — it will do very well; but for almost any other purpose of serious import it is very far from satisfactory or worthy of what we assume to be its author's real capacity. It is merely a money-making subscription-book on rather an elaborate scale, rushed into print as rapidly as possible in the hope of getting the cream of the market before other works of a similar nature could be got ready.

A curious want of what may be styled "temporal judgment" is shown by the selection of the present tense for use in a book which could not be finished during the life of the enterprise it professes to describe, and this, when added to the manner in which the long lines of the broad pages are broken up by the insertion of illustrations of all sorts and all sizes, makes the book a very disagreeable one to read, and this disagreeability is not offset by good classification, proper technical statement or satisfactory connection between the text and the cuts which have the appearance of illustrating it.

As a mere picture-book, the work is unquestionably interesting, but as a picture-book that is instructive it is a failure. The cuts are generally interesting, and, as a rule, admirably printed, but the insufficiency of the titling or the entire absence of a title, and still worse, the incompleteness of the information conveyed by the title, make it, as a useful picture-book, a failure. Add to this the immorality with which the author has failed to make a proper connection between text and cuts, and it will be seen that the book consists of two imperfect parts without proper connection between them. If a really good index is added to the book, it may possibly be made a little more valuable than it now appears to be. Unquestionably there is much good matter in the work, but what there is of it is uncommonly hard to get at.

The annual report of the City Engineer of the City of Omaha, Neb., for 1893 is an unusually interesting document, partly because it contains a special report on the several ways in which Omaha may be converted into a manufacturing centre by the construction of a power canal from the Platte River, but mainly because of the ingenuity displayed in conveying a deal of valuable information of statistical and permanent value by means of colored maps. By changing the colors and making a few minor alterations in the key-plan, Mr. Rosewater has produced half-a-dozen very instructive maps of the city under his charge. These maps show: (*a*) the hydrant pressure and position of the hydrants all over the city, the engine-houses and fire-alarm boxes; (*b*) the position of the sewers, whether of brick or pipe, and the lines of projected sewers; (*c*) the paved and unpaved street, indicating as well whether the paving is of stone, brick, asphalt or wood; (*d*) the lighting of the streets and the position of the lamps, whether gas, oil or electric.

SOCIETIES

THE ENGINEERS' CLUB OF PHILADELPHIA.

AT a business meeting, March 17, 1894, President John C. Trautwine, Jr., in the chair, one hundred and two members and visitors were present.

Mr. E. R. Keller made some interesting remarks on some results obtained in the Government investigations of American timbers, illustrated by large plates which he had prepared.

The timber investigations now in progress under the supervision of Mr. B. E. Fernow, of the Forestry Division, were first brought to the attention of the Club by the latter in a lecture in October, 1891. It is the object of these investigations to determine the physical, mechanical, chemical, and other properties of American timbers, and the interrelation existing between these. The subject of timbers has never before been treated in so comprehensive a manner in any country.

The investigations have been productive of some valuable results regarding long-leaf yellow pine, so abundant in some of our Southern States. The remarks presented are a condensation of such parts of the work as will be of special interest to the engineer.

Mr. Keller described in detail the apparatus and methods used by Professor J. B. Johnson in testing logs to determine:

(*a*) Cross breaking of large and small beams.
(*b*) Tension.
(*c*) Compression — endwise and cross-grain.
(*d*) Shearing.
(*e*) Properties of full-sized columns.

Regarding the long-leaf yellow pine, of more than ten species of pine found in the Southern Atlantic and Gulf States, not more than four reach our Northern markets, and of these the long-leaf yellow pine has no less than twenty-three different names, arising from the practice of designating different qualities by different names, and from the use of local names. The long-leaf species may be distinguished from others by the occurrence of the leaves in bundles of three — nine to twelve inches long — and by its cones, — six to nine inches long. Its wood is the heaviest of the Southern pines, being about 48 pounds per cubic foot. It has a fine and even grain, reddish-yellow color, very little sap-wood, and is pitchy throughout.

The results of tests of this wood were given, and the following deductions by Professor Johnson:

"The long-leaf-pine timber is specially fitted to be used as beams, joists, posts, stringers in wooden bridges, and as flooring when quarter sawed. It is probably the strongest timber in large sizes to be had in the United States. In small selected specimens, other species, as oak and hickory, may exceed it in strength and toughness. Oak timber, when used in large sizes, is apt to be more or less cross-grained, knotty, and season-checked, so that large oak beams and posts will average much lower in strength than the long-leaf pine, which is usually free from these defects. The butt cuts are apt to be wind-shaken, however, which may weaken any large beams coming from the lower part of the tree. In this case, the beam would fall by shearing or splitting along this fault with a much smaller load than it would carry without such defect. These wind-shakes are readily seen by the inspector, and sticks containing them are easily excluded, if it is thought worth while to do so. For highway and railway wooden bridges and trestles, for the entire floor system of what is now termed 'mill,' or 'slow-burning' construction, for masts of vessels, for ordinary floors, joists, rafters, roof-trusses, mill-frames, derricks, and bearing piles; also for agricultural machinery, wagons, carriages, and especially for passenger and freight cars, in all their parts requiring strength and toughness, the long-leaf pine is peculiarly fitted. Its strength as compared to that of short-leaf yellow pine and white pine is probably very nearly in direct proportion to their relative weight, so that pound for pound all the pines are probably of about equal strength. The long-leaf pine is, however, so much heavier than these other varieties that its given strength for given sizes is much greater."

A great many tests have now been made on short-leaf and on loblolly pine, both of which may be classed with long-leaf as "Southern yellow pine," and from these tests it appears that both these species are inferior to the long-leaf in strength in about the ratio of their specific gravities. In other words, long-leaf pine (*Pinus Palustris*) is about one-third stronger and heavier than any other varieties of Southern yellow-pine lumber found in the markets. It is altogether likely that a considerable proportion of the tests heretofore made on "Southern yellow pine" have been made on one, or both, of these weaker varieties.

DISCUSSION.

Mr. James Christie: Very extravagant claims have been made for Oregon pine. Have tests been made of this or other Western woods?

Mr. Keller: I believe not, as yet, but they will be taken up by the department later.

Mr. W. C. Furber: It may be of interest to give the results of some few tests of full-sized sticks of some joist which were made under my supervison for the new Harrison Buildings at Tenth and Filbert Streets. There were eleven sticks broken of 2 inches by 10 inches — 13 feet clear span — of the long-leaf pine, the modulus of rupture varying between 3,616 and 11,408. The lower values were for sticks with knots in the upper and lower fibres of the middle third of the span, knots of considerable size outside of this middle third seeming to have no detrimental effect. The higher values were for sticks almost or entirely clear of knots. These sticks of the long-leaf variety exhibited little tendency to buckle, and broke with little notice, at the different moduli given above, with a short fibre, some sticks exploding and flying into small pieces. These results agree closely with Lanza's published "*Tests on Yellow Pine*," in which he gives moduli of 5,092 to 11,360. None of these beams showed any tendency to longitudinal shearing along the neutral surface.

Four tests were made of the short-leaf pine, with moduli of from 8,000 to 10,096. The lowest value was for a stick with some knots — the other three were clear. All of this lumber showed a much greater deflection than the long-leaf, and a greater tendency to buckle. It frequently failed by the bottom fibres splitting off.

I hope soon to present the photographs showing these timbers before and after the tests.

Mr. Frederick H. Lewis read a paper on the new Building Law of the city of Philadelphia, of which the following is an abstract:

The Bureau of Building Inspection in this city is now about to be re-organized and enlarged in order to give full effect to the general building law enacted in June, 1893, for cities of the first class in Pennsylvania.

I venture the opinion that architects, lawyers, or engineers who may have to deal with this law will find it seriously defective in matter and in arrangement.

Of recent general laws enacted prior to our own, those of the cities of New York and Boston, dated April 9 and June 16, 1892, respectively, are the most notable and interesting. They have been freely drawn upon by the author of the law now under consideration, as evidenced by the verbatim reproduction of clauses, sentences, and whole sections. It is remarkable that such poor results should have been achieved in compiling our new building law from an abundance of fairly good material. The Pennsylvania law is neither clear nor forceful, and its regulations for the most part give details which are not of general application.

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From *Sections* 4 and 5, it is sufficiently clear that no building can hereafter be erected or altered, and no work done affecting the strength or the fire-risk of a building, except by permit from the Bureau, granted only after an examination of the plans and specifications to see that they comply with the law. The Bureau is authorized to decide, at discretion, on the thickness of pilasters and spandrel walls for buildings in which the weight is carried wholly by an iron or steel framework; to order the tearing down or repair of existing party or division walls, if not deemed satisfactory, for new constructions or alterations; to require piers and buttresses to be heavier than specified; and to decide for or against proposed roof and cellar-floor coverings. As the law gives no rules for walls over six stories in height, the new building problems now interesting engineers must be considered and passed upon by the Bureau in examining plans and specifications.

It is certainly very desirable that the Bureau exercising such a censorship as this over the building designs of the city should be well equipped in technical information, experience and ability, but the law gives little encouragement in this direction. It provides without making any distinction whatever, that the chief and assistant inspectors shall be "either practical builders, civil engineers, carpenters or bricklayers." Architects have no standing at all, and few engineers will care to take positions which will place them exactly on a par with carpenters and bricklayers. By the Boston law, the chief must be either an engineer, an architect or a builder, and his force is divided into engineers, clerks and inspectors, with distinctive duties. The New York law is still better. It provides that the superintendent should be appointed by the mayor, and may engage and fix the compensation of "such officers and employees" as shall be necessary to execute the duties imposed by the law.

There are certain appeals, which adjacent property-holders may, within specified time-limits, make from the decisions of the Bureau, first to the corps of inspectors sitting as a Board, and afterward to a commission of experts. The question here arises as to what authority building-inspectors can exercise on work in progress after a permit is granted. All that the law says on this point is that inspectors shall examine buildings in course of erection or alteration, and record all violations of the Act, and that they may require columns to be drilled for inspection. There are no fines or penalties except to enforce decisions on permits, unsafe walls and underpinning between adjacent properties.

It is remarkable, and it will probably prove troublesome, that the law should be obscure regarding the authority of inspectors over work in progress. The Boston and New York laws, which are copied in solid paragraphs in the administrative regulations, are quite clear and explicit in this respect, and our older laws are not so defective.

Section 26, relating to existing buildings, provides that in all warehouses, etc., the weight which each floor will safely sustain shall be estimated by a civil engineer or architect, and a detailed record thereof posted by the owner in a conspicuous place, within one year from the passage of the Act. This, if properly enforced, would serve the public interest in a very high degree. There is, however, no precaution to insure that these surveys shall be reliable, and the Bureau is not authorized to act upon the results, nor does it even receive copies of the reports. The New York law, from which this regulation is taken, further provides that the estimate shall be reduced to writing, stating particulars; shall be sworn to by the person making the same, and shall be filed in the office of the Bureau; after which, the superintendent, if he has cause to doubt the correctness of the estimate, can make further examinations, and regulate the distribution of the load on any floor. Why were such provisions omitted in our statute?

In our law, the portion referring to details of construction has been culled from various sources, and is a confusing mass of special details of no particular value, and apt to mislead in many cases. There is scarcely an intimation that walls should be proportioned to carry loads, or that foundations are intended to distribute loads upon the earth with pressure suitable to the bearing capacity of the soil. Most of the six-story walls given in *Sections* 11 and 14 will load the specified footings with over 7,000 pounds per square foot by their own weight alone, or with from 12,000 to 20,000 pounds per square foot, by including floor-loads; and even a three-story party-wall, with its floor-loads, will put 10,000 to 12,000 pounds pressure on these footings.

In the tables of enclosing and division walls of business buildings, the idea of making walls heavier in proportion to their length is elaborated, but no regular rule has been followed in doing this. The idea of increasing the thickness with the length has not had very wide recognition, and is open to discussion.

Section 11 is made up of clippings from the New York and Boston laws, and is most confusing in its wording. It probably means that "where trusses are used, the walls upon which they rest shall be thicker than is otherwise required by this section by at least four inches for every addition of twenty-five feet, or part thereof, to the length of trusses of more than thirty feet span. The same amount of materials specified may be used in piers or buttresses." It is also noticeable that the law does not deal with fireproof construction at all.

The safe loads of floors for business buildings, new or old, are required to be estimated by an architect or civil engineer. The loading per square foot is provided, and the loads are to be considered in the calculation as concentrated at the centre "in all cases." There seems to be no reason whatever why concentrated loadings should be considered in dwellings, office-buildings, public-halls, or the great majority of stores and factories.

In *Section* 17, it is provided that beams carrying joists or other beams must be reckoned for at least 200 pounds in buildings of any class, whereas such loadings are unprecedented and entirely unwarranted by considerations of fact, 100 pounds per square foot being considered quite sufficient for office-buildings, ordinary halls and highway bridges, while for dwellings 70 pounds is ample.

The law puts the unit stresses at one-sixth the ultimate strength, which is from fifty to sixty-five per cent of the figures usually adopted for wrought-iron or steel in buildings, so that our ironwork in buildings must be just about twice as heavy all around as in usual practice elsewhere. The provision with regard to wooden joists show that the author of the law did not realize what he was doing, as evidenced by *Section* 34.

The provision in *Section* 24 that "no greater weight shall be placed on any column, etc., than the published tables of said manufacturer show it to be capable of sustaining with safety," is, of course, absurd, as the manufacturer could readily get up tables to show that his products might sustain with safety one-third, or even one-half of their breaking strength.

The latter part of the law about hearths, chimneys, registers, and especially regarding theatres, is very good, the text of this being taken in full from the New York law.

Other contradictions and obscurities than those referred to will doubtless be found, and many cases will occur in which it is quite inadequate. It is remarkable that much is omitted which is found in other laws, and which one expects to find in a modern building law, and ours is positively bad to such an extent that the building operations of this city should not be saddled with it, and its early revision should be insisted upon.

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

HOUSE OF W. K. BIXBY, ESQ., ST. LOUIS, MO. MR. W. ALBERT SWASEY, ARCHITECT, ST. LOUIS, MO.

[Gelatine Print issued with the International and Imperial Editions only.]

THE house is built of brown terra-cotta with a brown-yellow Roman brick and red slate roof.

HOUSE FOR W. PERCY SIMPSON, ESQ., OVERBROOK, PA. MESSRS. BAILY & TRUSCOTT, ARCHITECTS, PHILADELPHIA, PA.

THE house is built of a local gray stone, blue slate roof, and Vermont-marble trimmings. The interior is all hardwood of several varieties — Indiana-limestone mantel in the hall; is provided with large elevator for raising trunks, etc.; has laundry in light basement and is heated by steam, an O. K. sectional boiler being used. The building is provided with electric-lights and gas, burglar-alarms, iron tanks and Roman tubs, and plate and crystal plate-glass in the windows. The whole house is lined with mackite boards and ordinary lime mortar. The style of architecture of the interior is Elizabethan with flowing-ribbed plaster ceiling in the hall. The building stands on a hill with a background of heavy woods, as indicated in the drawing, and is reached by a winding or a serpentine road from the gateway.

HOUSE FOR JOHN KATZ, ESQ., LYNCHBURG, VA. MR. EDWARD G. FRYE, ARCHITECT, LYNCHBURG, VA.

THIS house, which cost $25,000, is built of red brick with brownstone and terra-cotta finish. The roof is covered with red slate.

HOUSE FOR JOHN FOWLER, ESQ., ST. LOUIS, MO. MESSRS. STEWART, MCCLURE & MULLGARDT, ARCHITECTS, ST. LOUIS, MO.

PROPOSED HOUSE FOR W. J. HICKMOTT, ESQ., HARTFORD, CONN. MR. F. R. COMSTOCK, ARCHITECT, HARTFORD, CONN.

TWO SMALL HOUSES ON S AND R STREETS, WASHINGTON, D. C. MR. W. J. MARSH, ARCHITECT, WASHINGTON, D. C.

DESIGN FOR A COUNTRY HOUSE. MR. M. N. CUTTER, ARCHITECT, NEW YORK, N. Y.

PROPOSED COUNTRY HOUSE. MR. WALTER B. CRABTREE, ARCHITECT, NEW BRITAIN, CONN.

[Additional Illustrations in the International Edition.]

NORTH FRONT OF THE ADMINISTRATION BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. RICHARD M. HUNT, ARCHITECT, NEW YORK, N. Y.

[Gelatine Print.]

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ARABESQUES IN THE LOUVRE: SCHOOL OF RAPHAEL, XVI CENTURY.

[Photogravure.]

TUDOR HOUSE, HAMPSTEAD, ENG.: GARDEN FRONT. MESSRS. ERNEST GEORGE & PETO, ARCHITECTS.

NEW SCHOOL, ARMADALE, WEST LOTHIAN, SCOTLAND. MR. GRAHAM FAIRLEY, ARCHITECT, EDINBURGH, SCOTLAND.

In the plan of this school it will be seen complete cross ventilation is provided for, and there is the minimum of occasion for using one class-room as a passage from another. The cost will be about 2,500*l.*

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

PARQUETRY FLOORS: A PROTEST.

New York, N. Y., April 16, 1894.

To the Editors of the American Architect: —

Dear Sirs, — In your issue of March 31 you have, in an article entitled "Office-help for Architects," a description of parquet flooring and finishing of hardwood floors, which, as manufacturers, we must protest against, as being misleading and calculated to the injury of our business.

The method of manufacture described is the cheapest and least desirable of any employed, the finish for yellow pine flooring given will, if followed, in a very short time, result in making the floor indistinguishable, and the whole result would be to disgust the victim with hardwood floors of every description.

We, or any parquet floor manufacturer, would have been glad, if called upon, to give practical information, rather than have possible customers misled in that manner.

Very respectfully, National Wood Mfg. Co.

MARKET-HOUSES.

Springfield, Mass., April 11, 1894.

To the Editors of the American Architect: —

Dear Sirs, — I would like to know of any public markets in cities of 40,000 to 60,000 inhabitants in the Eastern, Middle or Western States. If any one can tell me where they are, I shall be greatly obliged. Yours truly, G. C. G.

EXHIBITIONS

Boston, Mass. — *Annual Spring Exhibition of Water-colors, Pastels, Black-and-Whites, and Sculpture:* at the Boston Art Club, April 9 to April 28.

Loan Collection of Paintings by William Morris Hunt: at the St. Botolph Club, April 3 to April 28.

Several hundred Specimens of Textile Designs of all countries, from the second century to the present time, from the collection given by Denman W. Ross; also a collection of Japanese Color-prints: at the Museum of Fine Arts, during April.

Water-colors by S. P. Rolt Triscott: at Chase's Gallery, 7 Hamilton Place, opens April 20.

Brooklyn, N. Y. — *Third Annual Exhibition of Architectural and Decorative Drawings of the Department of Architecture of the Brooklyn Institute of Arts and Sciences:* at the Brooklyn Art Association Galleries, 174 Montague Street, March 30 to April 21.

Buffalo, N. Y. — *Exhibition of Architectural Drawings:* at the Buffalo Library building, now open.

Chicago, Ill. — *Annual Exhibition of Water-colors:* at the Art Institute, April 3 to May 6.

Drawings and Etchings by Joseph Pennell: at the Art Institute, April 17 to May 7.

Sixth Annual Spring Exhibition of the Chicago Society of Artists: at the Society's Galleries, April 16 to April 28.

New York, N. Y. — *Sixty-ninth Annual Exhibition, National Academy of Design:* 23d Street and Fourth Avenue, April 2 to May 12.

Bookbindings: at the Grolier Club, open until April 28.

Exhibition of Amateur Photography: at the Galleries of the American Fine Arts Society, 215 West 57th Street, April 16 to April 28.

Philadelphia, Pa. — *Fourth Annual Exhibition of Water-colors and Pastels:* at the Art Club Galleries, March 26 to April 22.

NOTES AND CLIPPINGS

"Restored Rome is a German City." — Everybody finds in Rome, says Goethe, exactly what he brings to it. Unless he comes with education, sentiment, sympathy for what is beautiful in art and memorable in history, his visit will be fruitful in nothing but confused and bewildering impressions, leaving him with no desire to return. On the other hand, if he possesses in even modest proportion the conditions of intelligent appreciation, his sojourn, were it but for a week, will form an event in his life, full of grand and august associations, delightful to cherish and still more to renew. It is a fact that the descriptions of Rome which have most deeply impressed the world have been the work of men whose days in it were few, but who brought to it, in the highest degree, the essentials of culture and insight. Thousands of men and women have been as many years within its walls, as Goethe was weeks or Byron days. And yet from one page of the *Italienische Reise*, or from one stanza of *Childe Harold*, may be drawn more of the real Rome than the combined recollections of the thousand residents aforesaid could embody in a book. It is, indeed, the appreciative outsider that has done most for the resuscitation of the city's past, if not for the rehabilitation of its present; and just as, thanks to the Winckelmanns and Goethes, and Niebhurs and Bunsens, the Mommsens and Jordans, "restored Rome is a German city," so it is to the compatriots of these and the fellow countrymen of Arnold and Ruskin, of Clough and Hawthorne, of Freeman and Browning, that Italians themselves owe that respect for their noblest monuments, classical and mediæval, the want of which has aforetime resulted in such irreparable vandalism. But for northern, mainly Teutonic, scholarship and sentiment, but for German science and British-American taste and refinement, the Italy of archæology and romance — the Rome which to-day attracts pilgrims from civilized Christendom — would not only be immensely the poorer in actual treasure-trove, and in traditional relics, duteously conserved, but would miss, even among Italians themselves, that enlightened appreciation and reverence which contrasts so strikingly with the ignorance and apathy of the last two centuries and the first quarter of this. — *London Lancet.*

A New Palace in Venice. — Four hundred years have passed away since the last Gothic palace was erected in Venice, and one hundred and fifty since a palace of any kind was constructed. Not only that, but during these past centuries, whilst little or nothing was erected, hundreds of palaces were destroyed. Since the time of Napoleon alone it is calculated that between two and three hundred palaces, in all kinds of styles of architecture, have been demolished; now, happily, all that is ceasing. The last twenty or thirty years had been a period of conservation and of restoration. Property had doubled in value during that period. A palace on the Grand Canal that could have been bought in 1850 for from eight hundred to a thousand pounds, now costs two. Old tumble-down buildings have been made to "look as good as new." This property restoration throughout Venice has been chiefly the work of Jews. They are the richest merchants in the city, and at the head of the chief business houses. These buy up old houses at a small figure, put them in good order, and let them at rather high rents. The saying is common in Venice that wherever you see a house nicely done up you may be sure that it belongs to a Jew. The other great restorer of property is the Italian Government. As all ecclesiastical property belongs now to the Government, and many churches and similar buildings have been registered national monuments, the State charges itself with their maintenance. This has necessitated much expenditure in the way of restoration. Fifty thousand francs (2,000*l.*) are spent annually upon the conservation and restoration of St. Mark's Church alone. And upon the whole the restorations, whether effected by private citizens, by the Government, or by public corporations, are done in good taste. To a period of conservation and restoration is now being added one of construction. A lovely Gothic palace in pure style has just been erected on the Grand Canal, opposite the Grand Hotel and near the well-known church of the Madonna della Salute. — *Correspondence of the Scotsman.*

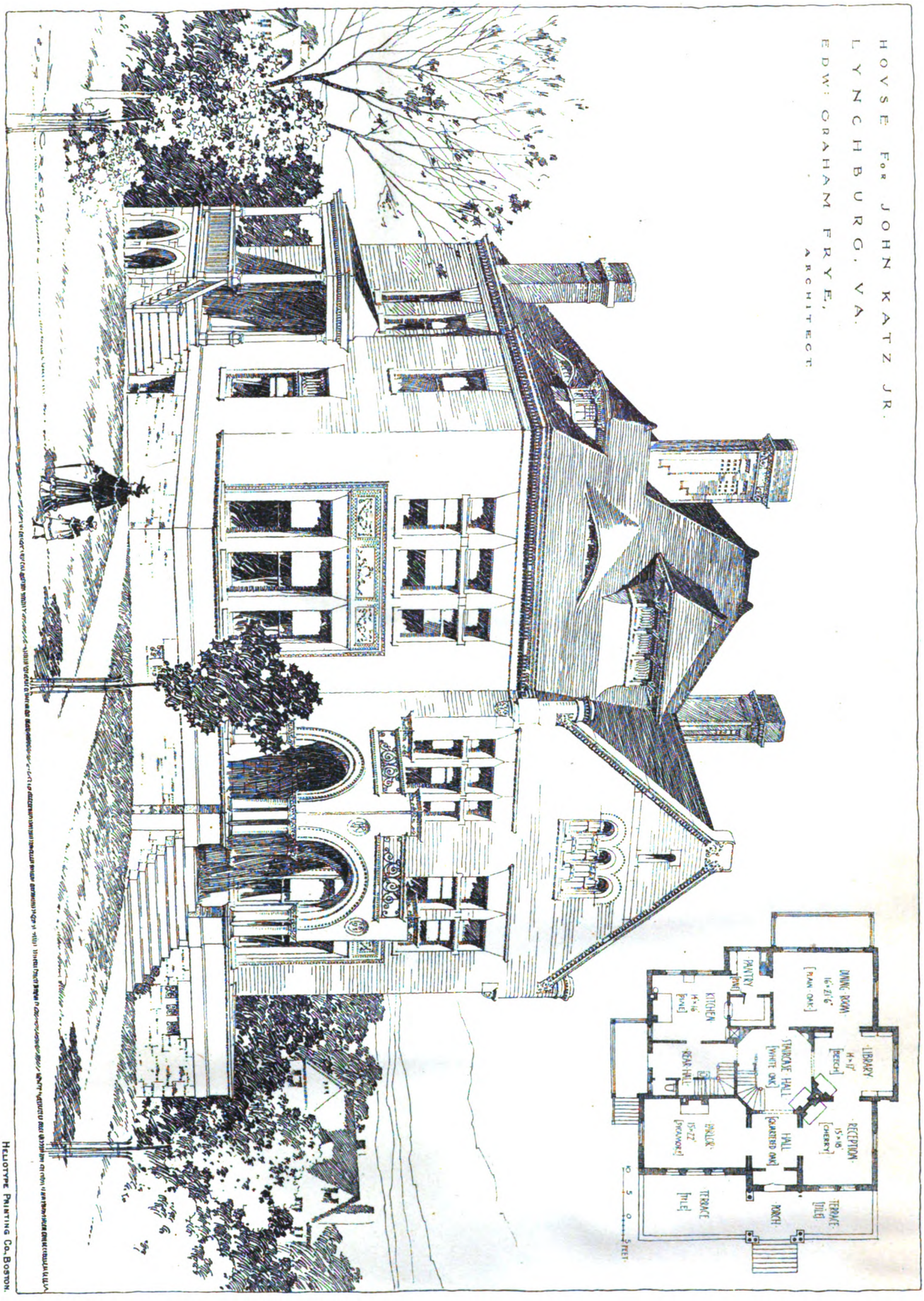
Smoke-abatement in Chicago. — The abatement of the smoke nuisance is still giving the authorities of Chicago a great deal of trouble, and a recent decision of Judge Gary threatens to add to it. In a case brought under the ordinance which forbids factory owners to pollute the air with clouds of smoke and imposes a fine for every offence, the judge held that they could not be compelled to burn hard coal. "Proprietors of such nuisances," says the chief smoke-inspector, "believe that Judge Gary's decision practically nullifies the smoke ordinance. It shall be my duty to teach them that it doesn't. The city cannot compel a man to burn hard coal, it is true. But it can and will compel him not to have large streams of smoke come from his chimneys. Any man who owns a chimney can burn soft coal, or old rags, or anything else he wants to so long as he doesn't create too much smoke. But if he makes a smoke nuisance, it will cost him $50 a day in fines. When he has paid $300 a week for a few months, he may decide that it will be cheaper in the future to burn hard coal and make less smoke. We shall also get at smoke offenders in another way. We shall enforce the city ordinance which provides that all engineers or stokers who wilfully permit dense volumes of smoke to issue from their chimneys shall forfeit their licenses." The building-commissioner promises to coöperate with the smoke-inspector in abating the nuisance by submitting to him all plans for new buildings. The commissioner will require that the capacity of chimneys shall be large enough, the draught strong enough, and the boiler capacity for power great enough to insure a proper combustion of the coal. These rules will extend to all plans for tenements, apartment-houses, stores, business blocks, shops, sky-scrapers, hotels, factories, and, in short, to every sort of building except the ordinary dwelling-house. — *N. Y. Evening Post.*

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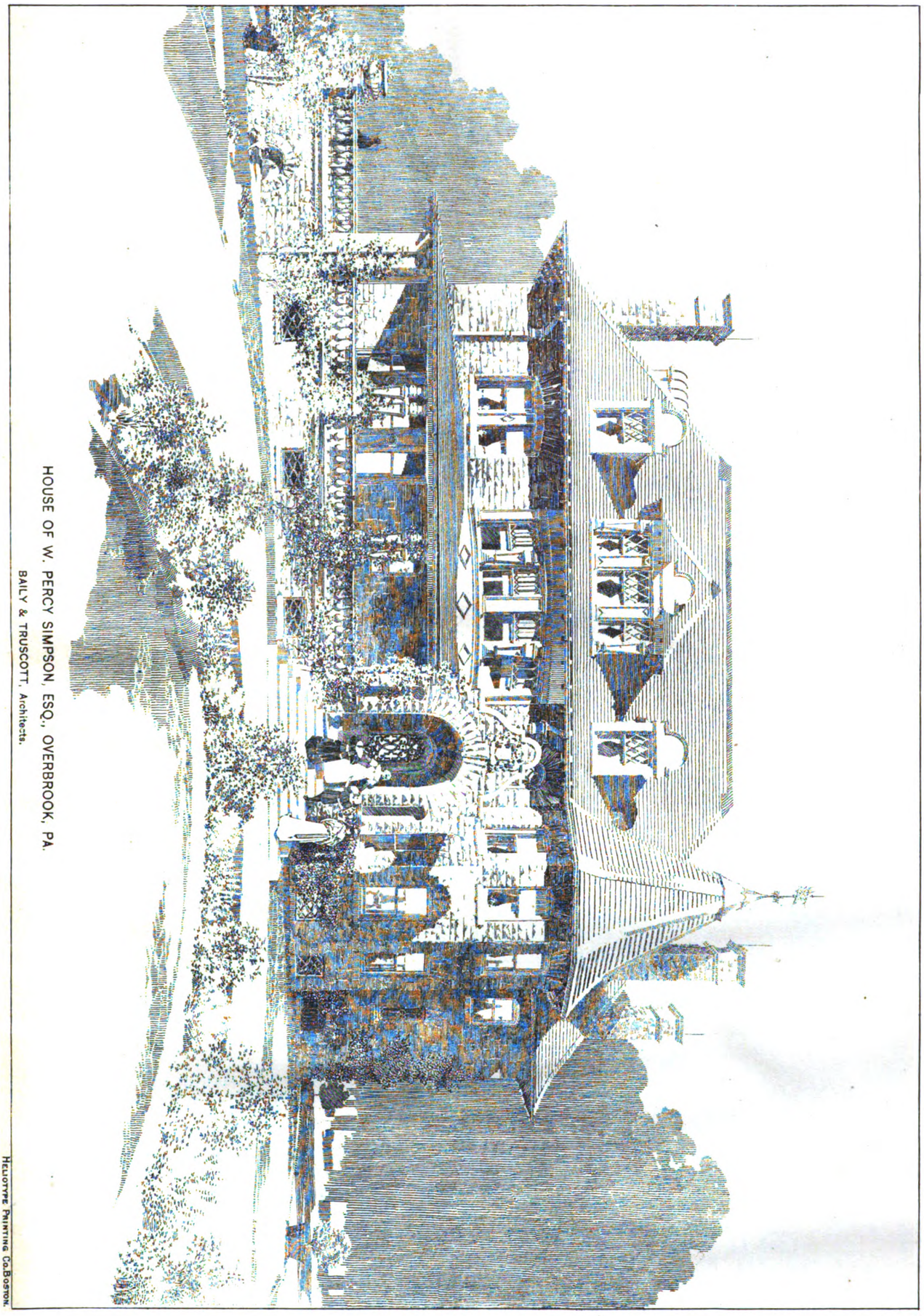


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Two small Houses · Washington · D. C.

· Wm. F. Martin ·
· Architect ·

1626 · "Y" Street · N.W.

"R" Street · West Eckington · D. C.

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FIRST FLOOR PLAN.

SECOND FLOOR PLAN.

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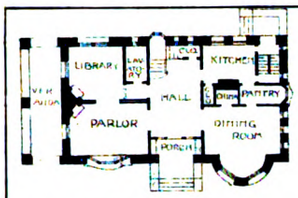
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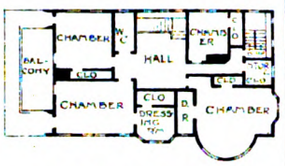
PROPOSED COUNTRY HOUSE

WALTER P. CRABTREE, ARCHITECT

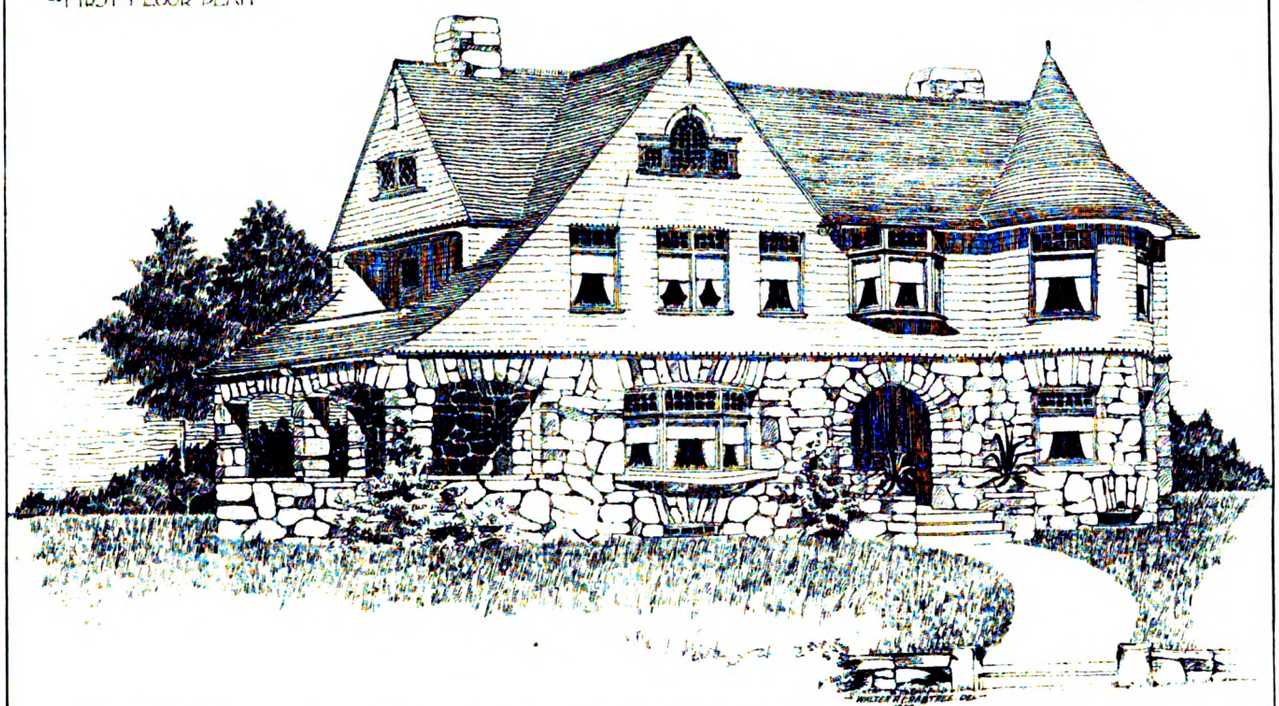
NEW BRITAIN, CONN.

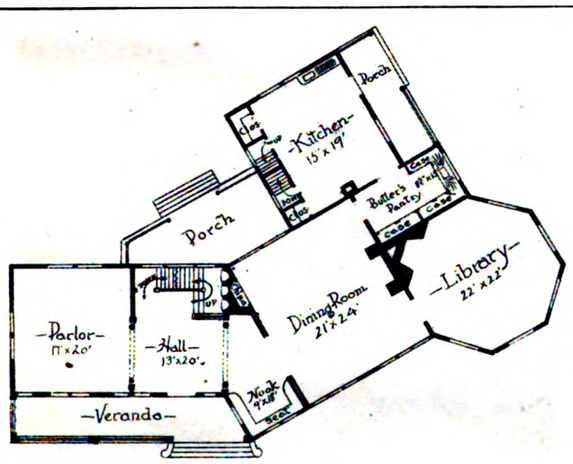


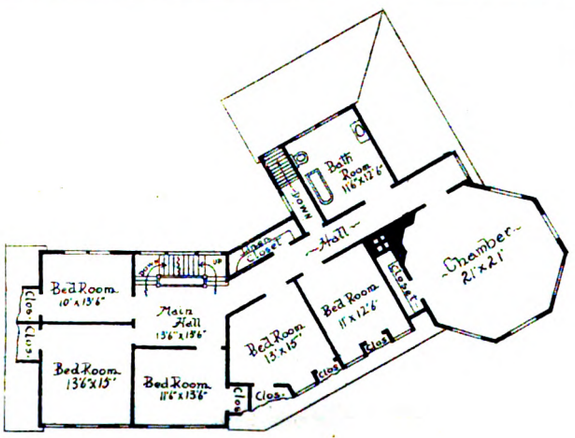
FIRST FLOOR PLAN



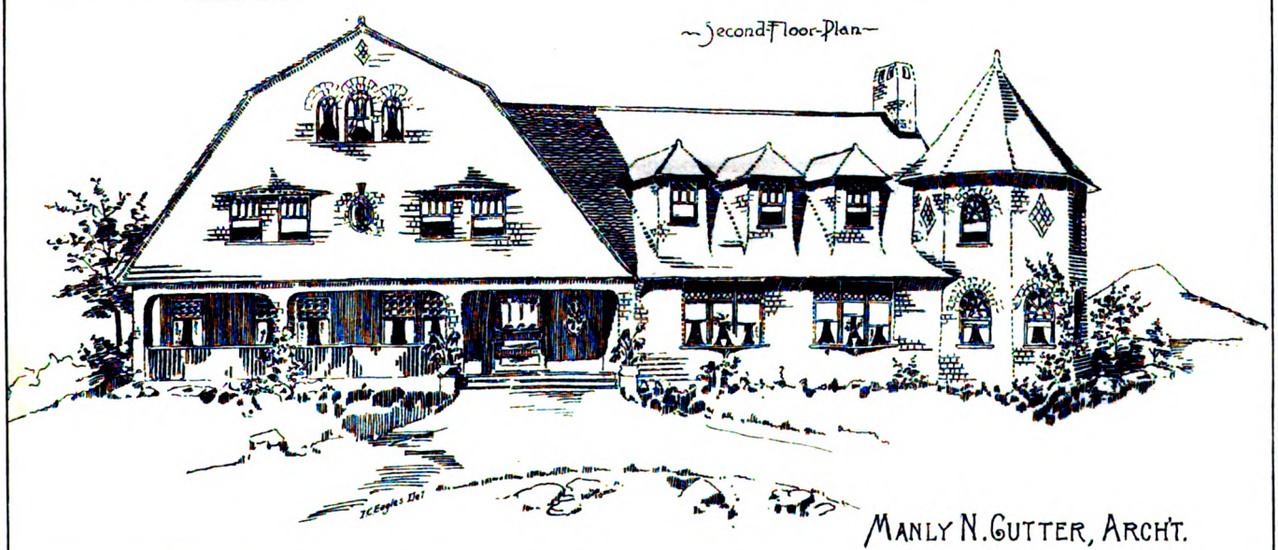
SECOND FLOOR PLAN







Second Floor Plan



MANLY N. GUTTER, ARCH'T.

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THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XLIV.

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APRIL 28, 1894.

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ILLUSTRATIONS: —
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Additional: The Indiana State Building, World's Columbian Exhibition, Chicago, Ill. — Design for a Museum of Antiquities, by Percier. — Tyntesfield, Bristol, Eng. — New Miners' Hall, Silksworth, near Sunderland, Eng. — New Board School, South Shields, Eng. 43
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NOTES AND CLIPPINGS. 44

EVERY fire which affects one of the great protected metal structures of the present day teaches us an important lesson as to the resistance of such structures to fire, and the points in which that resistance can and should be strengthened. A week or so ago, the Athenæum Building in Chicago, an old four-story structure, with wooden beams, took fire and was nearly destroyed. The rear of this building nearly adjoins the side of the Schiller Theatre, a new sixteen-story structure of steel, covered on the outside with hollow tile, in imitation of stone ashlar. The smoke and flame from the Athenæum naturally poured up against the side of the Schiller Theatre, and through the upper windows, setting fire to some of the wood finish in the upper rooms. The fire-engineers, fearing what might happen if the sixteen-story building should get thoroughly ablaze inside, kept a large force of men in it, with hose and chemical fire-extinguishers, and, at the same time, kept the outside cool with streams of water. In thirty minutes, the fire in the Athenæum was subdued, and that in the upper rooms of the Schiller Theatre was soon extinguished, but the combined effect of the fire and water had been to break away the hollow-tile covering of the outside, so that in some places the steel framework was exposed. The framework itself, however, was not at all injured, and the comment of the Chicago architects, which seems to be approved by the insurance experts and fire-engineers, is that, if the tile had been applied in two layers, so that, after the outer one had been destroyed, the inner one would still remain, it would have taken a very long-continued and hot fire to affect the structure from the outside. Whether the fire inside would have burned itself out quietly, if the firemen had let it alone, is not so well settled. The opinion of the architects seems to be that, the rooms having nothing combustible in them but the wood finish and light furniture, these might have been left to burn out; but the fire-engineers maintain the correctness of the opinion on which they acted — that if means had not been taken to extinguish the internal fire, the upper part of the building, at least, would probably have been destroyed.

EVERY member of the Institute, and hundreds of people outside the profession, will hear with regret of the death of Mr. W. W. Carlin, of Buffalo, a former President of the Western Association of Architects, and of the New York State Chapter of the Institute, and first Vice-President of the American Institute of Architects. Mr. Carlin, like too many architects, died in the very flower of his age and usefulness, not having reached his forty-fourth birthday. He was a country-boy, having been born near Chautauqua, in November, 1850. He studied his profession in the office of J. W. Smith, of Jamestown, and practised extensively in the principal cities of Western New York. As an architect, he was noted for his solid and sensible design, and his skill in construction, and was entrusted with a large number of important buildings. His professional reputation, with his unselfish willingness to do what he could to help his fellows, and his excellent judgment, early pointed him out for high office in professional circles. As the President, and most influential member, of the Buffalo Chapter of the Institute, he was mainly instrumental in securing the passage, through both houses of the New York Legislature, of the bill for the examination and licensing of architects, which failed to become a law only through the veto of Governor Flower. Personally, Mr. Carlin was one of the few men who inspire confidence and regard from the first in all who have anything to do with them. Earnest as he was in most things, particularly in matters affecting the interests of the profession, no personal or party feeling ever warped his clear understanding, or obscured the modest considerateness for other people which endeared him to all his associates, whatever might be their way of thinking. In his death the profession in America has lost one of its most valuable members, and his memory will long be cherished in the Institute.

WE quoted not long ago the editorial opinion of the Boston *Herald* on the Burnham-Carlisle correspondence, to the effect that Mr. Burnham's now celebrated letter, far from meriting the indignation which Mr. Carlisle devoted to it, was simply a truthful summary of the evasions with which the reasonable representations of the officers and committee of the American Institute of Architects had been met by the Treasury Department. The New York *Sun*, which, whatever may be thought of its politics, is, in many respects, the most intelligent newspaper in the country, speaks of the matter in the same vein as the *Herald*, declaring Mr. Burnham's letters to be "entirely justifiable." The *Sun* goes on to say that "Mr. Carlisle cannot dismiss the question merely because he is angry. Enlightened public opinion is with the American Institute of Architects, and against the Administration, in this matter." As to the abuses which the Institute is trying to have terminated, and which the Secretary of the Treasury is trying to perpetuate, the *Sun* says, with its usual force, "The damage done to the public taste by the vile standard established and maintained by the Federal architects, so-called, is incalculable. The money wasted in the construction of the hundreds of costly Post-offices and Custom-houses, drearily commonplace, or startlingly repulsive, according to accident, is nothing in comparison with the permanent injury inflicted upon this generation, and succeeding generations, by the constant contemplation of these degrading objects." This is certainly to the point, but, vigorous as is the language in which the *Sun* expresses its opinion, what it says is true; and the fact that it should be true is all the more to be regretted, from the fact that this country is rapidly advancing toward the rank of the most artistic country in the world. The architects, artists and sculptors of the United States, if they had such opportunities as are afforded their fellows in all other civilized nations, could produce buildings which would vie in beauty and splendor with any in the world; yet, after the necessary legislative action has been secured, one man, out of pure caprice, for the Burnham correspondence shows conclusively that there is no reasonable excuse whatever for not putting the Tarsney law in force, chooses to stand between his country and the artistic glory which awaits it, and to condemn this generation, so far as lies in his power, to be represented to posterity by the clumsy, ill-planned, badly built and enormously expensive structures on which such vast sums of public money have been spent, rather than by such work as our architects do for private clients. Private information leads us to believe that Mr. Burnham regrets the necessity he was under to use plain words, and that Mr. Carlisle no less sincerely regrets that he created the necessity for using them. This being so, and since a public servant can acknowledge a mistake with less discomfort than can a private individual, it seems perfectly possible that the correspondence should be expunged from the record and negotiations again taken up at the point where the correspondence began.

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THE Association for the Promotion of Profit-sharing, of which Hon. Carroll D. Wright, of Washington, is President, and General Francis A. Walker, of Boston, Mr. Henry R. Towne, of the Yale & Towne Lock Company, are two of the Directors, has issued a letter, inviting the attention of manufacturers to the importance of introducing some form of profit-sharing as a feature of their industrial relationships. As many factories and mills are now resuming work, after a long period of idleness, the time chosen for the issue of the letter is a very happy one, and it is much to be hoped that it will receive earnest attention. The Association, we are glad to see, puts its recommendation on the high ground of the importance of promoting a greater community of interest, and more friendly relationship, between employers and employed, and offers to give detailed information in regard to the working of the system in various establishments in this country and abroad, to any one who will take the trouble to apply for it to the Secretary, Mr. N. P. Gilman, 25 Beacon Street, Boston. Mr. Gilman is well known as the author of an excellent book on the history of profit-sharing, and it would be hard to find any one better qualified to indicate examples to be followed, or to give advice on the subject. Although we agree with the Association that the main thing to be kept in mind in the discussion of profit-sharing is the restoration of friendly confidence between employers and employed, too long estranged, it is worth pointing out that the first effect of the revival of this confidence is to disconcert the schemes of the politicians and socialist demagogues who have reaped such a rich harvest from their efforts to set up "workingmen" as a class apart from the rest of the world. Where profit-sharing exists, the walking-delegate and the socialist spouter find no place, and it is not surprising that, where the system has begun to secure an extensive foot-hold, the air resounds with the denunciations of the "champions of labor," who see their political influence, and their comfortable incomes, fast vanishing.

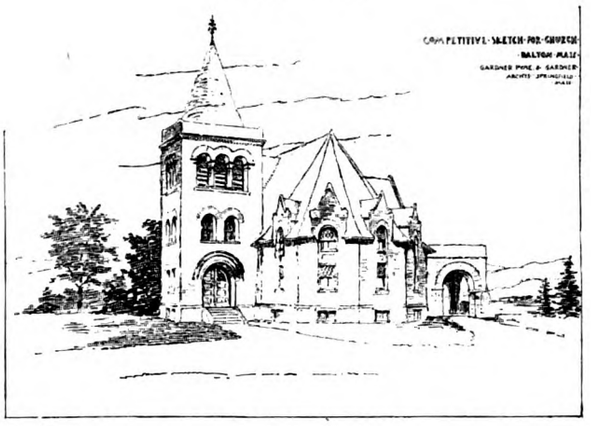
THE immense multiplication of appliances for the electrical transmission of force in and about our cities has led to some curious consequences, and is likely to lead to very serious ones. Every one knows that electrical currents move only in circuits, and that in order to obtain any electrical manifestation at any point, there must not only be some means of conducting the current from the generator, but a means of conducting it back again to the place that it started from. In all the earlier electrical installations, the earth was used as a great universal conductor for return currents, the "grounding" of the wire, after utilizing the current from it, being considered the only thing requisite for maintaining the continuity of the circuit through the generator, which had also its ground-wire for, so to speak, pumping up electricity from the common reservoir — the earth. Now, however, the earth, which conducts with comparative slowness, cannot be advantageously used to carry return currents for many sorts of apparatus, and "metallic circuits," in which the return current, as well as the outward current, is conveyed by copper or iron wire, are used for many purposes, of course at an increased cost. For the return currents of electric railways, it has been common to have two modes of conveyance, one through the rails, connecting these by metallic straps or wires, and another through continuous copper wires, laid between the rails. Both these together are, however, as commonly arranged, insufficient to convey the enormous currents which return along a line of electric railway, and the electricity continually leaks away, in search of an easier and less crowded road back to its source. It is apt to find this in the water and gas mains which pass near the tracks, and the consequence is that strong currents often pass through the mains into the earth, while the mains themselves, owing to the resistance which the current encounters in leaving them, are charged with electricity to an extent which may become dangerous, particularly as the ramifications of the mains, which extend into the houses supplied by them, partake of the charge. One of the electrical inspectors for the Boston Board of Fire Underwriters reports that he frequently finds water and gas pipes in houses in such a condition, owing to one of them having taken up an electric current at a point, perhaps, miles away, that a strong current will pass between them if they are either purposely or accidentally connected by a piece of wire. In one case, where the two sets of pipes came within a foot of each other, the current obtainable in this way was strong enough to give a spark which would set fire to cotton-waste; and many ingenious residents on the lines of the electric railways, as he says, have put in electric-bells, electric gas-lighting apparatus, and so on, availing themselves of the current which they could obtain gratuitously by tying the supply-wire around a gas or water pipe. If the waste of the current were the only harm done, perhaps no one but the stockholders of the railway company need complain; but the leakage currents in the gas and water mains rapidly corrode them, so that large pipes have been eaten entirely through in three months. In one case, where a gas and a water pipe were brought into frequent contact by the jarring of an elevator, the gas-pipe was not only nearly corroded through, but a bright spark passed at every contact, so that, as soon as an orifice had been made through which the gas could escape, the gas would have been set on fire.

A GERMAN doctor is said to have been experimenting on the navigation of the air in a way which must give him a valuable personal sensation of the capacity of the atmosphere to support weight. The apparatus that he employs is very simple, consisting of a light frame covered with cloth, and with a hole in the middle, through which he puts his head and arms, while straps confine the affair in a suitable position just under his arms. It would appear that no provision is made for flapping these artificial wings, and the muscular power of a man's arms, even if assisted by his feet, as was provided for in an apparatus devised a hundred years ago or more, would be hardly adequate to raising his body into the air with any sort of artificial wings; but, instead, the surface of the cloth-covered frame is formed in peculiar curves, which experience has shown to be suited for making the buoyant power of the atmosphere available. Equipped with this apparatus, the doctor is said to take a start by running a short distance down a steep hill. After a run of a few minutes, he finds himself lifted off the ground by the air, and can then soar for a long distance before alighting. With favorable conditions of wind, he is said to have made in this way a flight of nearly a quarter of a mile, reaching a height of ninety feet or more above the ground. The account is well authenticated, and we feel justified in commending experiments of the sort to the attention of other investigators who are not troubled with nervousness. In relation to the general problem of aerial navigation, these attempts have great value in determining the conditions affecting what, as it seems to us, will be the most practicable mode of navigating the air — that is, soaring from a height, attained by some other means than that used for forward propulsion. It is evident that, if the air-ship of the future can be raised, at starting, a mile vertically into the air, a voyage of a hundred, or even a thousand miles from that point can be made with the employment of very little force beyond that of gravitation, and, if this preliminary raising can be effected by means, so to speak, outside of the craft itself, an immense freight of machinery, which would otherwise be necessary to lift the vessel, could be dispensed with. By the employment of hydrogen gas, used solely for this temporary purpose, it would be easy to lift the air-ship to the requisite height, and start her on her voyage, while stores of hydrogen, compressed into steel cylinders, could be carried along, for use in case it should be necessary to take a fresh start in the course of the voyage. In this way, a large part of the work of driving the vessel, say across the Atlantic, would be done on *terra firma*, without, as it seems to us, any loss of security to passengers, but rather the reverse, as the vessel would be lightened of a huge load of engines, boilers and fuel.

THE Town-hall of Palma, the capital of the Balearic Islands, was destroyed by fire a few weeks ago. Palma has within the last few years become tolerably well known, through books written by enthusiastic tourists, and by the verbal accounts of other tourists, who, in consequence of the books, have visited the place; and all the visitors have something to say about the Town-hall, or Ayuntamiento, with its rich sculptures, and its huge, carved, wooden cornice, projecting ten feet over the street, and carried by a row of brackets in the shape of human figures. The building dated from the sixteenth century, and contained a splendid picture, by Vandyke, of the Martyrdom of St. Sebastian, besides a curious collection of portraits of Balearic notables.

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STYLE.[1]— I.



STYLE, especially in architecture, has been but little studied from a philosophical standpoint; this is because artists seldom write, and also because writers are deterred from undertaking the subject by their lack of familiarity with its technical difficulties.

The geographical position of a people offers necessities whose influence is felt upon its morals as well as in its social and political interests, forming by an *ensemble* of certain qualities and certain defects what is called a national character. Artists are far more susceptible to these influences than the majority of the nation and it is chiefly among them that we find exaggerated expressions of the national character. In southern countries this character almost always bears the stamp of indolence and of contemplativeness, carried even to dreaminess. The artist who daily experiences the languishing effects of perpetual sunshine, in a land where fragrant spring and autumn with her sweet fruits seem to divide the year between them, beholds the sun toning into harmony the most vivid colors and giving to the slightest projections a vigorous relief; he contemplates the simplicity of lines so in consonance with the calm of a cloudless sky; he finds that the lightest sound acquires a charming intensity in the pure atmosphere; in short, the sun himself becomes man's accomplice here, forcing nature to surrender her treasures and relieving him of the trouble of seizing them. It is easy to understand how man, surrounded by such favors, should have but little love for those labors of analysis which philosophy would demand; he is content with what he sees, with what he hears, with what is about him, and, in these admirably prepared surroundings, he is born an artist, consulting in dainty fashion the ever open book of gracious Nature and impressing his art with the same sense of ease and abundance. Among the people of the North, the national character is something very different. Here, man and artist are laborious, industrious, inquisitive and prudent even to an unreasonable extent; they have all the excellences of the southerner's defects and all the defects of his excellences. Obliged to battle with the inclement weather of all seasons, the man of the North is forced to violent exercise and is compelled to demand from rude industries the bread which rebellious nature often denies him. Under a lifeless sun, the palest colors always seem hard to him, and, to produce any appreciable effect, he is driven to projections which would appear exaggerated if they were not necessary; beneath a lowering sky, to respond to the chaos of the elements, he piles form on form, roof on roof; the noises that come to him through a mist-laden atmosphere are softened to his ear and cause him to turn to music for powerful effects; lastly, his constant struggle against the effects of the *milieu* in which he is constrained to live obliges him to go back to causes in order to find the remedy, so that the artist is, within, a philosopher.

While one of the two artists whom we are considering will seek after the great effects of shade and small surfaces of light, on the exterior of his building, in order to produce the desired impression of coolness, the other, by broad lighted surfaces and strong shadows of slight extent, will throw the greatest possible amount of sunlight on his; in the interior, everything will be arranged to bar out the heat and devouring brilliancy of day in the first case; in the other, all will tend to enclose and protect, but without excluding the sunlight. However, opposite though these two methods may seem in their results they rest upon the self-same principle, namely, to secure the comfort of the inhabitant. Man is the point of departure for all that is for his use. Harmony will prevail to the same degree in the art of both regions, though with different local accents; graceful majesty will be the portion of the South, manly pride the lot of the North.

With less strongly-marked characteristics, the art of intermediary people is subjected, in turn, to extreme influences; after frequent efforts to recover itself, it assimilates these influences, while at the same time so tempering them, as often to produce a genuine creation.

As we have implied above, artists cultivate the arts as it were without knowing it, as the result of their surroundings, and without any control over the origin of their sentiments. The writers who have analyzed the works of artists have sought for the philosophy of art in painting, sculpture and music; architecture has been seldom, if ever, approached by them, on account of the technical difficulties that stand in the way, and the people of the North, almost without exception, are the only ones who have produced artists sufficiently philosophical and patient to write on the subject. And, yet, if the art, the literature and the institutions and beliefs of a people must be consulted in order to resurrect its extinct civilization, with how much reason, *a fortiori*, should its architecture, which embodies all these things — because of the considerable efforts that it represents, and of the accent of truth it contains — occupy the first place.

But, before treating of style in architecture from a philosophical standpoint, it seems to us desirable to view the subject in general according to our understanding of the term.

Philosophy (from the Greek Φιλος, friend, and Σοφια, wisdom) claims, however incorrectly, to be a guide for life. How many victims, nevertheless, have been sacrificed in its name and in the name of liberty!

The two principal philosophies are the idealistic and the materialistic. The aim of the former is the quest of an ideal, outside of and above matter; while the latter is kept confined to the examination of the material manifestations of our senses. Thus, materialism has considered man as a molecule attracted or driven unconsciously toward the gratification of wants necessary to the support of his physical life. The brain, says this science, secretes the fluid indispensable to thought: therefore, thought is wholly in this fluid; if the fluid is abundant, thought is abundant. Man is a machine that beholds the *ego* disappear with free will, and, free will ceasing to exist, conscience can no longer exist: finally, without conscience, the notion of a God apparently becomes nothing but a sublime folly, and the moral code, which is derived from God and the conscience, is facultative and disappears in its turn. It is evident, then, what society would become if it should lose respect for all law, for the laws rest on moral guaranties and the observance of contracts, both of which would have already dissappeared; therefore, punishment could not be exercised with sufficient vigilance to compel the performance of the social duties and secure the social rights of each individual. A state of good fellowship would shortly be followed by a state of savagery; justice would be replaced by force, solidarity by isolation; to plenty would succeed famine, for who would voluntarily consent to work to-day, only to be pillaged to-morrow? And we should go back to a condition of slavery, where the stronger would impose his will on the weaker. Sinister dream, shameful degradation, the work of ignorant men!

With materialism, then, society would be impossible; it regards life purely as a mechanical action, and, without any ideal, with the essentially deceptive basis of the senses; it affirms, nevertheless, that being matter it will return to matter.

What incomprehensible despair in the presence of the most striking proofs to the contrary! In fact, do we not see man living in society as a consequence of the observance of social contracts, imposed by material needs, and of the divine law, resting upon respect for morality — morality, the existence of which, joined to free will, imposes the *ego?* This *ego* is, then, able to do good or evil, rise or fall voluntarily; this *ego* which has a comprehension of the best of perfection, that is to say of the possibility of performing an act which, although not profiting the individual and being possibly even a disadvantage to him, may be an improvement, an advancement in a realm distinct from matter; force reigns in matter, force constituted by the *ensemble* of the wonderful laws that control the body, laws to which divine wisdom has subjected the universe, and

[1] From the French of Léon Labrouste, in Planat's *Encyclopédie de l'Architecture et de la Construction.*

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which no one can escape except by the divine will, therefore, no one can without error assume that this wisdom would consent to the overthrow of its own laws, in obedience to a human injunction. The body, its task accomplished, demands rest and shrinks from a new effort; the soul, its duty fulfilled, rejoices and aspires to a new sacrifice. The social laws forbid us to do evil to our neighbor, the divine law compels us to serve him; if this law were obeyed, how many miseries would be avoided; for evil comes to us almost wholly from the selfishness of men, or from material necessities, while all good and all consolation come from God and morality. Matter is created perfect for the mechanical uses to which it is reserved; we cannot change its combinations without altering its nature; hence, it is not perfectible, but merely capable of modification. Why do I possess the sense of justice and the sense of perfection, notions of which do not come to one directly from nature? Why have they entered the human mind? They do not profit me, they do not answer my physical needs. They are then outside of matter and imperiously demand the *ego*, an *ego* composed of immaterial needs distinct from the needs of my body. Now, if I am conscious of immaterial needs, it is to feed and give life to something immaterial in me which would perish without nourishment, as my body requires material nourishment to supply its needs; this thing which is immaterial in me I call the soul, and this soul, which in its essence cannot be decomposed, is perforce indestructible, imperishable. Mathematical truths are absolute and eternal; from them we are able to affirm also that, every product being of the same nature as its factors, if my body is the product of matter, an immaterial factor is requisite to my soul — God, the infinite limit of all perfections. Materialistic philosophers have been deceived by appearances, and it seems to us puerile on their part to fix the bounds of the intellectual horizon by the length of range of their own vision, this range differing for each individual. If we reflect that the immaterial soul can be put in communication with the material nature only by means of the intermediary instruments of our body, called organs, the impressions and manifestations of which are summed up in our senses, we shall understand that the soul, while remaining entire, will have impressions dependent upon wrongs done to these organs, and that it will lose the notion of truth and even of the material life.

What would you say if you were asked to give correct results with only false instruments at your disposal? You would declare the thing quite impossible. What would you say if an instrument did not work in which one of the main parts was broken? You would probably consider that perfectly natural. Strange deduction! Why should you, because you are a materialistic philosopher, arrive at opposite conclusions? Because man never enjoys the decree that condemns, and because he prefers neither to hear nor see.

Our object in touching upon the questions of idealism and materialism in this article was to show in what sense we believed philosophy was to be followed, and we sincerely hope that a real service has been rendered to art by demonstrating that without the ideal neither a social state, nor art, nor progress would be possible.

[To be continued.]

THE ITALIAN RENAISSANCE. — I.

NOTES FOR ARCHITECTURAL STUDENTS.

IN the *American Architect* for March 31, there appeared an editorial paragraph calling attention to the travelling class in architecture for the study of the Renaissance in Italy, which Professor Hamlin, of Columbia College, is to conduct this coming summer. In view of the interest which this proposed enterprise has developed among architects generally, it has been thought that a somewhat detailed account of the intended work and an itinerary of the class might prove useful and suggestive to a considerable number of architects and students whose studies must be pursued at home, but especially to such as hope at some future time to travel over the same ground themselves. The bibliography and list of monuments recommended for special study, which is being prepared for the use of the class, is of course far from exhaustive, but being intended for the practical use of its members, can hardly fail to be of service to many others who are seeking by reading and travel to become more or less acquainted with the history and works of the Italian Renaissance.

As announced in the editorial referred to above, the class is scheduled to meet in Naples early in June. It is expected that most of its members will sail from New York on May 26 by the "*Kaiser Wilhelm II*," the balance starting a week later by the "*Werra*." These will, of course, lose five or six days of class-work, the intention being to begin active study on or about June 7, remaining in Naples until the 15th or 16th, when the class will start for Rome, stopping over at Caserta on the way to visit the royal palace and gardens there. Naples, in June, is a very agreeable place, and with the surrounding attractions of Ischia, Sorrento and Capri, Pompeii and Vesuvius, there is much to beguile the traveller into a longer stay than the purely architectural interest of the region would warrant.

The Renaissance was late in reaching Naples, and its monuments are almost entirely the work of others than Neapolitans. The city possesses a number of fine Gothic churches and fortifications of the thirteenth and fourteenth centuries, but very few structures of the latter part of the fifteenth century except chapels and tombs. Even the cinque-cento produced little that is notable in Naples. The most conspicuous monuments are those belonging to the seventeenth and eighteenth centuries, and one can here study to his heart's content the cold and elegant classicism of Domenico Fontana, the splurge and extravagance of the Rococo and "Jesuit" styles, and the still later work of Vanvitelli and his successors.

If one excepts the Palazzo Gravina, the Arch of Alphonso and the Porta Capuana, and the florid productions of the decadence, really the most instructive and interesting manifestations of the Renaissance in Naples are to be sought in the tombs and monuments, chapels, altars and doorways of the latter part of the fifteenth and of the early sixteenth century, in churches built at much earlier dates. These Gothic churches have, many of them, moreover, been altered, "restored," and decked with Palladian façades at various times, so that mediæval and Renaissance work is mingled in a way impossible to set forth in a tabular list without an amount of detail and a minuteness of enumeration quite unnecessary for our purposes.

The literature on the Renaissance in Naples is scanty. The voluminous work of Sasso, "*Monumenti di Napoli*," is so full of gross and ridiculous errors of date and attribution of the designs as to make its text worthless, except for the works of the eighteenth century, which it illustrates and describes with some detail. The student in search of detailed historical information will find his Murray and Baedeker quite the handiest and most useful books of reference. Two or three of the chief monuments are illustrated in the Schütz portfolios of heliotypes ("*Die Renaissance in Italien*") and referred to in the general works on architectural history.

On general works of reference for the Renaissance period, a few words should be said here. The only work of this class in English of real value to the architect is Fergusson's "*History of Modern Architecture*," in the revised edition (London, 1892). The lively and entertaining style of this book must commend it to the general reader, to whom it will prove very valuable if its critical estimates of particular monuments be taken with a due grain of salt, or with a certain reservation of the reader's judgment. The list of monuments enumerated is, however, not nearly so complete as that in Lübke's "*Geschichte der Architektur*," which, by reason of this very abundance of monuments cited, takes on in places almost the character of a catalogue, and is less interesting to read, even to a thorough master of German. The little hand-book of Pever Im Hof, "*Die Italienische Renaissance*," is valuable for its illustrations — mainly elevations in outline — of notable buildings: it can be had of any importer of German books for $2.50. Unquestionably the most valuable work for the student of the Italian Renaissance, if only he can read German, is Burckhardt's "*Cicerone*," especially the section devoted to architecture, and to which the Schütz heliotypes may be taken as the illustrations. It is a pity this part of the work has not been translated into English.

A brief sketch of the Italian Renaissance in architecture is found in the first section of Gwilt's "*Encyclopædia*" (pages 131 to 151), and a much fuller account, with illustrations, in Palustre's "*L'Architecture de la Renaissance*," (livre premier). This little hand-book belongs to the "Bibliothèque de l'Enseignement des Beaux-Arts," published by Quantin, in Paris: it is to be hoped that the volume just cited may be soon translated. The price of the book is $1.35.

Lives of a number of the great architects of the Italian Renaissance (Brunellesco, Alberti, Bramante, Peruzzi, the San Galli, Michael Angelo, etc.,) may be found in Vasari, "*Vite dei Pittori*," in Italian, or in English translations; and in Quatremère de Quincy's "*Vies des plus illustres architectes*," a work long out of print, but accessible in the larger public libraries. Lists of architects of the Renaissance with dates and chief works may be studied in the text of Letarouilly's "*Edifices de Rome Moderne*," and in Gwilt's "*Notitia Italiana*" (somewhat incomplete as to dates) — a rare work printed in 1818, in London.

For the historical, literary, political and intellectual aspects of the Renaissance there are abundant works to read or consult. We might mention especially Walter Pater's "*The Renaissance*"; Symonds's "*The Renaissance in Italy*," especially the volume on "*The Fine Arts*," which, however, treats much more fully of the painting and sculpture than of the architecture of the period; and Middlenine's excellent translation of Burckhardt's "*The Civilization of the Period of the Renaissance in Italy*" for the political and social aspects of the Renaissance movement.

The monuments of the Renaissance in Naples enumerated below are those specially recommended for study by the travelling class. Of course, the list is far from exhaustive, and there doubtless exist many interesting bits and fragments of Renaissance work which the

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members of the class will discover, that are not mentioned even in Murray or Baedeker.

Fifteenth Century.

THE BRANCACCI MONUMENT in church of S. Angelo a Nilo: about 1440, by *Donatello* (1386–1466) and *Michelozzo* (1391–1472).

ARCH OF ALPHONSO OF ARRAGON (or gate of the Castel Nuovo): 1470 by *Giuliano da Majano* (1432–1490); or by the Milanese *Pietro di Martino.*

PORTA CAPUANA: 1484 by *Giuliano da Majano* for Ferdinand I of Arragon.

PALAZZO CUOMO: end of fifteenth century by Florentine architects.

PALAZZO GRAVINA: 1499 by *Gabriele d'Agnolo* (1480–1510); much altered in subsequent times.

CHURCH SAN SAVERINO: 1490–1520 by *Mormando* of Florence.

CHAPELS AND TOMBS: by *Giovanni da Nola, Benedetto da Majano* (1442–1497) and others in many of the older churches, especially Monte Oliveto, S. Domenico Maggiore and S. Maria la Nuovo.

Sixteenth Century.

CHAPELS IN CATHEDRAL AND S. GIOVANNI A CARBONARA.

CHURCH OF S. GIACOMO DEGLI SPAGNUOLI: 1540, perhaps by *Merliano da Nola* (Gwilt).

S. MARIA LA NUOVO: "restored" in 1525, by *Agnolo Franco.*

S. TRINITA MAGGIORE (or the Gesù Nuovo): 1584.

NATIONAL MUSEUM, (Museo Reale Borbonico): 1586, by *Domenico Fontana* of Rome, (1543–1607).

S. PAOLO MAGGIORE: 1590, by *Grimaldi.*

Seventeenth Century.

CAMPANILE OF SANTA CHIARA: about 1600.

PALAZZO REALE: 1600–1615, by *Domenico* and *Giovanni Fontana.*

FOUNTAIN, on terrace of Santa Lucia: *Domenico d'Aures* and *Giovanni Merliano.* (?)

CHAPEL ST. JANUARIUS in Cathedral: 1608.

S. FILIPPO NERI (Ch. dei Gerolomini): 1620.
Many new façades, ceilings, stucco decorations in older churches.

Eighteenth and Nineteenth Centuries.

CHURCH OF SANTA CHIARA: modernized 1752, by *Luigi Vanvitelli* (1700–1773).

CHURCH OF THE ANNUNZIATA: 1757, by *Luigi Vanvitelli.*

HEMICYCLE OF SPIRITO SANTO: 1757, by *Luigi Vanvitelli.*

PALAZZO PRINCIPE D'ANGRI: 1760, by *Luigi Vanvitelli.*

CHURCH OF SAN FRANCESCO DI PAOLA: 1819, by *Pietro Valente.*

THEATRE OF SAN CARLO: 1810, by *Medrano.*

GALLERIA UMBERTO: 1889, by *di Mauro* of Rome.

In addition to these are the Renaissance objects in the National Museum; and, of course, the student of the Renaissance cannot afford to pass over the splendid treasures of Classic art in that Museum and at Pompeii, since Classic art was the foundation and inspiration of Renaissance design.

CASERTA.

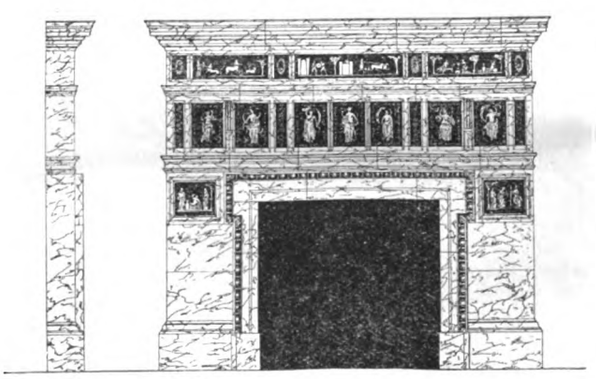
Here one monument alone engages our attention, the splendid Royal Palace erected about 1750–60 from the designs of *Vanvitelli;* with its four courts, magnificent staircases and sumptuous gardens, of which the unrivalled *château d'eau* is the most important single feature.

From Caserta the class proceeds to Rome for a stay of about four weeks.

A. D. F. HAMLIN.

[To be continued.]

SIR PHILIP CUNLIFFE-OWEN.



A Modern British Chimneypiece, South Kensington Museum. Drawn by Giles Whiting.

THE death of Sir Philip Cunliffe-Owen will be deplored by many thousands of British industrials who had been brought into close contact with him at International Exhibitions, and who never found him wanting during those periods of difficulty and high pressure. Few persons are privileged to leave behind them as wide a circle of friends and admirers, or so successful a record as Sir Philip Owen, and his death can be regarded as no ordinary loss, although he had for some little time past resigned his active official life. Since 1855 to the date of his death Sir Philip Cunliffe-Owen was closely associated with exhibition work, and since 1873 he occupied the elevated position, as Sir Henry Cole's successor, of Director of the South Kensington Museum. To him may be ascribed the organization of that splendid institution, as well as the establishment of the Bethnal Green Museum, the extent and completeness of which are but little realized at the west end of London. From its commencement, the career of Sir Philip Cunliffe-Owen was strictly an official one, and it is an evidence of his great powers that forty years of Government routine had failed to hamper him with the bonds of officialism. Capt. Cunliffe-Owen, of the Royal Navy, intended that his son should follow the same profession in which he had won reputation, and for five years he wore midshipman's uniform in active service, but his health was not equal to the calling, and he retired in early youth to turn to some more congenial work. This was shortly after the brilliant success of the first World's Fair of 1851 had encouraged the Prince Consort to persevere in the great work with which his name will be always associated; the Science and Art Department was the embodiment of the Prince Consort's scheme, but the primitive home of that department, which was destined to develop into the magnificent buildings it now occupies, had not been commenced when young Owen took service under Sir Henry Cole. A very few years later, the first opportunity offered that laid the foundation of a great reputation. Paris, in 1855, followed London's example of 1851; an important British section formed a part of the first French International Exhibition, and a situation as superintendent was given to Owen. One can easily imagine that he was admirably well adapted for his position, and that the potential ability and energy within him made themselves felt for the comfort and well-being of the exhibitors placed under his charge. Exhibitions, great and small, had a freshness and attractiveness in those days, when medals and jury-awards were worth striving for, and the calling of the exhibition-monger was unknown. Owen saw the path for a great career opened to him at the Palais de l'Industrie in 1855, and he followed it steadfastly to the last, winning honors and friendship as he went. An accomplished linguist, a born diplomat, possessing an experience rare in those early days, and allied by marriage to a distinguished German house, Philip Cunliffe-Owen was richly equipped with natural and acquired gifts to perform the important duties of promoting English industrial progress abroad, and to safeguarding British commercial interests. The record he had made at Paris in 1855, coupled with the fact that in 1860 he was appointed Assistant Director at South Kensington, under Sir Henry Cole, naturally led to his being elected to fill the important position of Director of the Foreign Sections at the London International Exhibition of 1862. The tact, patience, and sympathy he brought to bear upon this task, combined with his great ability and energy, established his foreign reputation, and made it evident that at all future exhibitions held within the limits of his active life, the voice and influence of Owen must be predominant. Naturally he went to the second Paris Exhibition of 1867, this time not as a superintendent, but in charge of the entire British section. It must have been a period of well-deserved triumph, and his administration was certainly a pleasant one, not only for the exhibitors, but for himself. The British Government was very liberal, and more than 120,000*l.* were granted to uphold British interests on the Champ de Mars. It was much the same story eleven years later at the great Paris Exhibition of 1878. Very many remember with what credit this country was represented on that occasion, when money was again plentiful, and exhibits numerous. But, as every exhibitor knows, a generous treasury is not the only, nor indeed by any means the most important, element in the successful administration of a foreign section. What is of vital moment is the character of the executive chief. He must combine experience, tireless energy, unlimited tact, patience and geniality; he must be all things to all men; his ears must be open to all the grievances, real or imaginary, of the exhibitor, and he must be ever ready to attempt to remove the one or explain away the other; his eye must be everywhere, and he must show by his constant presence that he is worthy of the great trust reposed in him; and with all these qualities must be combined inflexibility of purpose, boldness of action, and promptness in decision. British exhibitors who have enjoyed the advantage of Sir Philip Owen's management will endorse our statement that he possessed these qualities, and more than that, those who knew him best can testify that the geniality was real, the sympathetic nature ever rang true, the warmth of interest in the smallest exhibitor was never simulated. The epoch of exhibitions will pass away without such a one as Owen coming again amongst us, and his name in connection with them will remain famous, not in this country only, but throughout the world.

But although Cunliffe-Owen's more brilliant triumphs were those of Paris, 1867 and 1878, and perhaps that of London, 1886, to our mind his real greatness shone out most brightly during the troublous period of Vienna in 1873. His enemies — for of course Sir Philip Cunliffe-Owen had enemies, and the bitterest of them were those who owed him the deepest debt of gratitude — accused him of lavish extravagance; even his friends (and surely few men have passed away leaving behind a longer and a truer list) considered that he carried open-handed generosity to a fault. Let us recall the story of

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1873. Twenty years after the first great International Exhibition — the World's Fair of the Prince Consort — the Archduke Ranier announced that an International Exhibition of the arts, industries, and sciences would be held in Vienna in 1873, and all the nations of the world were invited to attend. The following March the Austrian Ambassador, Count Beust, informed Her Majesty's Secretary of State for Foreign Affairs of the great anxiety of the Austrian Government that Great Britain should be worthily represented at the approaching exhibition. In accordance with the desire expressed, a Royal Commission was appointed. This Commission was narrowly restricted in its financial power; only 6,000*l.* had been voted by Parliament, and this sum would barely suffice to pay very limited office expenses in London and Vienna, and to inform British manufacturers of the nature and scope of the exhibition. The Commission was a most distinguished one, having H. R. H. the Prince of Wales as its president, and consisted of fourteen members with Mr. Philip Cunliffe-Owen as secretary, appointed to this post, not by the members of the Commission, but in Her Majesty's Warrant. By virtue of this Royal appointment, the labor and responsibility of creating and controlling a creditable British section fell on Cunliffe-Owen. To achieve this result he had at his disposal a sum of 6,000*l.*, and he was handicapped by the fact that, for the first time, exhibitors were to be charged for the space they occupied by the Exhibition authorities. It was not a large tax, amounting to less than 2*s.* a square foot in the front part of the buildings, and falling to about 3*d.* a foot in the parks. Still it was an innovation objectionable to the British exhibitor, and the prejudice it occasioned had to be overcome by tact and perseverance. At a later date the Government grant was increased to nearly 29,000*l.*, but this addition proved entirely inadequate to meet the expenses associated with the administration of what proved to be an important British Section. The strong personality of Sir Philip Owen enabled the Commission to make good the deficiency. It was he who influenced the noble generosity of Sir Richard Wallace, and induced him to take the whole charge of the Fine Art exhibit, which, it will be remembered, was a highly successful one. Following this example, other members of the Commission subscribed liberally to meet certain necessary charges, which alone enabled the British portion of the exhibition to be opened in a state of completeness on May 1, 1873. It was Sir Philip Owen who arranged, to the benefit of exhibitors, facilities for transit for themselves and their goods, at rates unheard of before that time, and it was he who, after the close of the exhibition, and a triumphant record for the British section, collected and issued four volumes of closely-printed reports, covering nearly 3,000 pages. There were about 800 industrial exhibitors, and it will be remembered by many that the agricultural and live-stock groups were essentially worthy of the high reputation of England. Quite apart from the pecuniary assistance Mr. Owen managed to obtain for the benefit of the Section, nothing but the most rigid economy and watchfulness, combined with great ability and skill, enabled him to carry his work to a successful conclusion, having satisfied nearly all and leaving behind him, on the part of exhibitors and officials, the most pleasant associations. The record of the British section of the Vienna Exhibition contains a complete refutation of the charge of reckless expenditure that has been raised against the exhibition management of Sir Philip Cunliffe-Owen.

It was in 1873 that he succeeded Sir Henry Cole as Director of the South Kensington Museum, a post he retained till the time of his retirement, a year ago, finding leisure at not infrequent intervals for taking a responsible part in exhibition work. His reputation in the United States was assured in 1875, when, as Executive Commissioner for Great Britain at the Centennial Exposition of Philadelphia, he visited that city officially. All the preliminary work of the Section at that exhibition was done by Sir Philip Owen, who, however, retired from the work before the buildings were opened to the public. A recent experience showed us that, brief as his visits to America were, his name alone is still remembered by Americans, in connection with the British Sections of 1876. We have already spoken of the Paris Exhibition of 1878, and the Indian and Colonial Exhibition of South Kensington is fresh in the minds of all; it was as a recognition of his distinguished services at this exhibition that he was created a K. C. B. The government did not recognize the Paris Exposition of 1889, and for this, if for no other reason, Sir Philip Owen would have been unable to take any part in that celebration; but his experience and counsel were always at the service of those actively engaged, and it was to no small extent due to his guidance and advice, that Sir Polydore de Keyser was enabled to do so well, with limited means, and under conditions of exceptional difficulty, as he did at Paris in 1889. As a member of the British Royal Commission of the Columbian Exposition, Sir Philip Owen, until a year ago, took an official part in the administration. Before that Commission was formed, he, together with General Donelly, were consulted by the Government, and the Department of Science and Art would probably have accepted the responsibility, had not Sir Philip considered that the grant of 25,000*l.* was wholly inadequate; he stated that 60,000*l.* would be required, and it will be remembered that the grant was subsequently raised to that sum. If the larger sum had been voted in the first instance, there is no doubt that once more Sir Philip Owen would have accepted the position of Foreign Commissioner at Chicago, and the Section would have been placed under his wise and sympathetic control. It is very doubtful, however, whether he could have withstood the fatigue of the work involved, for his health was already failing, and the time of his retirement was at hand. His term of service at South Kensington expired last year, and though he had intended to remain at his post still for a short time, a dangerous and sudden illness precipitated the abandonment of the position he had so ably filled for twenty years. For the last twelve-month his life had been full of suffering, borne with cheerfulness and resignation, in the full knowledge of the approaching end to a long career of usefulness. Perhaps it was better that he has been spared years of enforced inactivity, and was taken from us when his work was done, crowned as it has been with many honors, and the love and esteem of many friends. The esteem and the honors had been fairly won, and not, as it too often happens, gained through accident or influence. The list would be too long for us to give here, but we may mention some of the more conspicuous. In 1873 he was made a C.B., and after the Paris Exhibition of 1878 was created K. C. M. G. and C. I. E., while at the close of the Indian and Colonial Exhibition he received the distinction of K. C. B. Of foreign orders he possessed an endless variety (including the Grand Officer of the Legion of Honor), and decorations from almost every country in Europe. Her Majesty the Queen and H. R. H. the Princess of Wales sent touching tributes of their regard to Sir Philip Cunliffe-Owen's grave, which was surrounded by many friends, by whom, as by a far larger circle, he will be always remembered as essentially a man of his time. — *Engineering.*

THE PYRAMID OF DASHUR.

THE discoveries made by the French Director of Excavations in Egypt, M. de Morgan, near one of two ancient brick pyramids not far from Cairo, are exciting the deepest interest in London and Paris, as well as among the tourists and European residents on the Nile. Brief allusions were made early in the month in the current news of the fine arts, but these finds are so important that further notice is necessary.

The tombs and presumably the brick pyramid (since bricks found in the subterranean tombs are like those of that monument itself) belong to kings and princesses of the Twelfth Dynasty.

Egyptologists have divided the dynasties of the Pharaohs into thirty and group the thirty into dynasties one to eleven, twelve to nineteen, and twenty to thirty. This is merely for convenience, and was unknown to Herodotus, Manetho, Josephus and others who have written about the early kings. Nor did the Egyptians themselves have any such system. From the first group (one to eleven) we have only the slenderest details and no jewelry or gold ornaments. Indeed, it is not till we reach the eighteenth that we get in our museums and that of Egypt, certain objects that belong to the minor arts of personal decoration, and so forth. The excitement that M. de Morgan's find has aroused is, therefore, natural; for here are art-works of very great beauty from the tombs of at least three Pharaohs — Usertsen II and III, and Amen-em-hat III, whose reigns are placed by Mariette between 2366 and 2300 B. C., or about 4,000 years ago.

Concerning Usertsen II, we know that a Semitic tribe called the Aamu came from a country named Absha with tribute. Concerning Usertsen III, we are told by the inscriptions that he made a great campaign up the Nile against the black Nubians and built a temple at Elephantiné. As to Amen-em-hat III, he is of even greater note, since it was he who built in the Fayum the great artificial reservoir for his people, which was called Lake Mœris, the site of which is still debated. He also built the labyrinth, said to have had 1,500 rooms above ground and 1,500 below. Lake Mœris stored up the water of the Nile during the seasons of floods, and was tapped in the dry season as required.

Herodotus has a quaint story picked up in Egypt about 450 B. C., which may relate to one of the brick pyramids at Dashur, concerning a king of the unrecognizable name Asychis. He wrote on a piece of stone the following apology: "Do not disparage my worth by comparing me to those pyramids composed of stone. I am as much superior to them as Jove is superior to the rest of the deities. For, thrusting poles down into the lake, and collecting the mud deposited on the poles, bricks were fashioned, and in this manner was I made." The meaning of which may possibly be, that, in the opinion of the king, or of the Egyptian who told Herodotus this particular yarn, it was more honorable to a pyramid to be built of the fertile mud of the Nile than the dead stone of the desert.

Humility like this seems to have failed to put the grave-robber off the scent for funereal treasures, since the brick pyramid in question has been ruined in every direction, and is now only ninety feet high, a long mound of disintegrated, sun-dried brick, with its top a mere crater. Even the tombs at some distance were rifled long before Herodotus, yet the robbers either missed some of the spoil, or themselves proceeded to bury some with the intention of returning at a better moment. Some side chapels, or niches, were found still walled up, but the richest treasures were discovered several feet under the floor of a gallery strewn with skulls, broken or empty boxes, and fragments of sarcophagi.

M. de Morgan must be credited with a good deal of sagacity in this discovery. He is the third important director of excavations in Egypt since Napoleon III lent Mariette to the Egyptians. After Mariette came Maspéro; after Maspéro came Grébault; now it is his turn to uphold the honor of France in a field opened by

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Napoleon the Great a century ago. His excavations in the Caucasus for the French Government some years ago prepared him for this work. Having selected the brick pyramid as a good site for very early tombs, he drove a shaft directly through its centre to the bed-rock without positive results. Then he moved to some distance and began sinking shafts, well knowing the efforts made by these kings to conceal their tombs. Finally, on February 28, he struck an unimportant tomb. But the bricks were like those of the pyramid. He had found the radius. On March 2 his foreman reported a door of cut stone; breaking through that, a low tortuous gallery was found heading toward the pyramid and ending in a tomb, with the remains of a sarcophagus and a statute carved in diorite, which robbers had broken up, perhaps thinking that they contained treasures concealed in the stone. — *N. Y. Times.*

SOCIETIES

T-SQUARE CLUB.

THERE was a meeting of the T-Square Club on Wednesday, April 18. The subject for competition was "A Memorial Library for a Small Town." First mention was awarded to Robert C. Heath; second to E. L. Powers; third to Geo. G. Bassett. This is the last regular meeting of the Club until October.

GEO. BISPHAM PAGE, *Secretary.*

AMERICAN INSTITUTE OF ARCHITECTS.

MEETING of the Executive Committee of the American Institute of Architects, at the rooms of the Institute, New York, April 21, 1894.

Present: *President* Daniel H. Burnham, *Vice-President* George B. Post, *Treasurer* Samuel A. Treat, *Secretary* Alfred Stone and Messrs. E. H. Kendall, C. F. McKim and R. W. Gibson.

An announcement was made of the decease of the following Fellows of the A. I. A. since the meeting of the Board of Directors, January 8th and 9th:

George H. Edbrooke, New York, January 25, 1894; George Walter da Cunha, Montclair, N. J., January 31, 1894; August Bauer, Chicago, February 8, 1894; William Worth Carlin, March 23, 1894, and proper minutes in regard to the same were ordered to be made by the Secretary.

The death of Mr. Carlin having created a vacancy in the Board of Directors, Mr. A. Page Brown, of San Francisco, was elected to fill the vacancy.

The death of César Daly, of France, for many years an Honorary Member, was announced, and Mr. R. M. Hunt and the Secretary were appointed a committee to prepare a suitable minute and to communicate the same to the family of the deceased.

The death of John Baird, a Corresponding Member, was also communicated to the Committee.

The letter-ballots were opened and the following persons were found to be elected as Fellows of the A. I. A.

WILLIAM SCHICKEL.....	New York, N. Y.
FREDERICK PERKINS.....	Chicago, Ill.
CHARLES P. BALDWIN.....	Newark, N. J.
GEORGE EDWARD HARDING....	New York, N. Y.
JAMES WARRINER MOULTON..	New York, N. Y.
ARTHUR PAGE BROWN.....	San Francisco, Cal.
JOSEPH WOLF.....	New York, N. Y.
JOHN HEMINGWAY DUNCAN....	New York, N. Y.
JAMES BROWN LORD.....	New York, N. Y.
LAWRENCE J. O'CONNOR.....	New York, N. Y.
ROBERT WILLIAM GILBERT....	Marquette, Mich., and Superior, Wis.
JOHN STEWART BARNEY.....	New York, N. Y.
WILLIAM TYSON GOOCH	New York, N. Y.
JOHN GODDARD STEARNS.....	Boston, Mass.

It was voted that J. S. Walker, architect and engineer of Samoa, be recommended by the Board at the next annual meeting for election as Corresponding Member of the A. I. A.

Messrs. Kendall and McKim and the Secretary were appointed, on behalf of the Institute, to act with a committee of the New York Chapter to make the necessary arrangements for the annual convention to be holden in New York on October 16th and subsequent days.

The President was requested to arrange with not less than six persons to prepare and read papers at the annual convention.

The Secretary read a communication from the Secretary of the Boston Chapter of the A. I. A., in regard to the publication of the "*Thesaurus of Architecture*" by Baron von Geymuller and a resolution in regard to the same passed by the Boston Chapter; whereupon the President was requested to correspond with Baron von Geymuller and represent to him the views of the Institute as expressed in the communication and resolution referred to above, that the great value of the work would be impaired by confining its issue to thirty copies at $5,000 a copy, and that it would very much increase its value and usefulness to change the manner of its publication, increasing the number of copies to be printed so as to enable it to be sold for $1,000 a copy, and thus bring it within the means of a larger number of societies and individuals and secure for it a large constituency and wider distribution.

A communication in regard to uniform coinage was postponed for further action.

A communication from Mr. R. M. Hunt, Chairman of the Committee to procure data for a history of the Institute, was received, stating that the committee had arranged with Mr. A. J. Bloor, for so many years the Secretary of the Institute, to furnish from his abundant store of knowledge such data for the use of the Institute.

It was voted that the President appoint a committee of five to consider the Bill now before Congress in regard to Government architecture, said committee to make suggestions in regard to the Bill and its provisions, with full power to take such action for and in behalf of the Institute as it may deem proper and wise.

It was voted that Executive Committee of the A. I. A. takes this, its first opportunity, to unanimously endorse and approve the action of Daniel H. Burnham, the President of the Institute, in the conduct of the correspondence which he has carried on, in behalf of the Institute, with Hon. John G. Carlisle, the Secretary of the Treasury, with reference to the designing of buildings for the Federal Government. [Adjourned.]

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

THE HOO-DEN OR PHŒNIX PALACE, ON THE WOODED ISLAND, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL.

[Heliochrome, issued with the International and Imperial Editions only.]

STORES AT SOUDERTON, PA. MR. MILTON B. BEAN, ARCHITECT, LANSDALE, PA.

THE front of the building, 88′ x 110′, is three stories. The exterior is of Philadelphia press brick, light gray, in tinted mortar; the cornices, etc., are all galvanized-iron; the interior is finished in oak. The cost was $18,000.

COMPETITIVE DESIGN FOR THE UNIVERSITY OF CINCINNATI, O. MESSRS. DESJARDINS & HAYWARD, ARCHITECTS, CINCINNATI, O.

COMPETITIVE DESIGN FOR THE UNIVERSITY OF CINCINNATI, O. MR. W. S. DUTTON, ARCHITECT, CINCINNATI, O.

CASINO AT WEST HARTFORD, CONN. MR. F. R. COMSTOCK, ARCHITECT, HARTFORD, CONN.

CENTRAL FIRE-HOUSE, PHILADELPHIA, PA. MR. JOHN T. WINDRIM, ARCHITECT, PHILADELPHIA, PA.

WHOLESALE WAREHOUSE FOR THEODORE WETMORE, ESQ., MINNEAPOLIS, MINN. MR. H. W. JONES, ARCHITECT, MINNEAPOLIS, MINN.

[Additional Illustrations in the International Edition.]

THE INDIANA STATE BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. HENRY IVES COBB, ARCHITECT, CHICAGO, ILL.

[Gelatine Print.]

DESIGN FOR A MUSEUM OF ANTIQUITIES, BY PERCIER.

[Copper-plate Photogravure.]

TYNTESFIELD, BRISTOL, ENG.

NEW MINERS' HALL, SILKSWORTH, NEAR SUNDERLAND, ENG. MR. HENRY GRIEVES, A. R. I. B. A., ARCHITECT, SOUTH SHIELDS, ENG.

THIS building contains on the ground-floor a large assembly-hall, with gallery and recessed platform, also reading-room, committee-rooms and retiring-rooms; on the first floor, billiard and recreation rooms. The elevations are carried out in red bricks, with stone dressings and carvings. The roofs are covered with Westmoreland green slates. The cost has been about 3,400*l.*

NEW BOARD SCHOOL, SOUTH SHIELDS, ENG. MR. HENRY GRIEVES, A. R. I. B. A, ARCHITECT, SOUTH SHIELDS, ENG.

THIS school will give accommodation for 490 scholars, and contains on the ground-floor a large schoolroom, two classrooms, teachers'-room and cloak-rooms, etc., and on the first floor a school-room, three class-rooms, teachers'-room and cloak-rooms. The two school-rooms are fitted with sliding partitions, and can each be converted into two class-rooms when required. The elevations are of red brick, with stone-dressings, etc. The roofs are covered with Welsh slates. The cost will be about 3,500*l.* The building will be heated throughout by hot-water.

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EXHIBITIONS

Boston, Mass. — *Annual Spring Exhibition of Water-colors, Pastels, Black-and-Whites, and Sculpture:* at the Boston Art Club, April 9 to April 28.

Charcoal Drawings by F. Hopkinson Smith: at Doll & Richards Gallery, 2 Park Street, April 20 to May 2.

Loan Collection of Paintings by William Morris Hunt: at the St. Botolph Club, April 3 to April 28.

Several hundred Specimens of Textile Designs of all countries, from the second century to the present time, from the collection given by Denman W. Ross; also a collection of Japanese Color-prints: at the Museum of Fine Arts, during April.

Water-colors by S. P. Rolt Triscott: at Chase's Gallery, 7 Hamilton Place, opens April 20.

Water-colors of Bermuda by C. Scott White: at Gallery of Foster Brothers, 164 Boylston Street, April 18 to May 5.

Buffalo, N. Y. — *Exhibition of Architectural Drawings:* at the Buffalo Library building, now open.

Chicago, Ill. — *Annual Exhibition of Water-colors:* at the Art Institute, April 3 to May 6.

Drawings and Etchings by Joseph Pennell: at the Art Institute, April 17 to May 7.

Sixth Annual Spring Exhibition of the Chicago Society of Artists: at the Society's Galleries, April 16 to April 28.

New York, N. Y. — *Sixty-ninth Annual Exhibition, National Academy of Design:* 23d Street and Fourth Avenue, April 2 to May 12.

Bookbindings: at the Grolier Club, open until April 28.

Exhibition of Amateur Photography: at the Galleries of the American Fine Arts Society, 215 West 57th Street, April 16 to April 28.

St. Louis, Mo. — *Exhibition of Architectural Drawings by St. Louis Chapter, A. I. A.:* at the Museum of Fine Arts, April 25 to May 9.

NOTES AND CLIPPINGS

Smoke-absorption. — A system of smoke-absorption, invented by Colonel Dulier, has been applied at the City Saw Mills, Glasgow, and careful data taken by Mr. R. R. Tatlock, public analyst of that city. The boiler in use is a Babcock & Wilcox's water-tube steam generator working a 220-horse-power engine, and consuming daily about 3 tons of coal and ½ ton of wood scraps and chips. Before entering the usual chimney the gases ascend a short brick flue, and then descend a flue of steel plates dipped at a high temperature in a tar composition, entering the ordinary stalk at the bottom. At the bottom of the ascending flue is a jet of steam at boiler temperature, while at the top of the descending flue is a fine spray of water. The carbon is thus separated and, with the water, drops into a sump at the foot of the descending flue, being thence carried off in pipes. The coal used showed 31.40 per cent gas, tar, etc., 48.70 per cent fixed carbon, .84 per cent sulphur, 6.56 per cent ash and 12.50 per cent water. Before treatment, analysis showed that the products of combustion contained 5.8 grains of sulphuric acid per 100 cubic feet, and after treatment 2.8, while in another case the reduction was from 9.5 to 4.2. As to soot, the first test showed a decrease from 73 5 grains to 2, and the other test from 23.3 to 1.5 grains. In other words, from 94 to 97 per cent of the soot was removed, and fully a half of the sulphuric acid. Tests showed that the draught was not affected, being .5 inch in the flue, and .4 inch in the chimney. The water used was 8,000 gallons per day, costing 2*d.* in Glasgow. Of course, with the apparatus, inferior coal can be used without the usual emission of dense smoke. — *Engineering.*

How Walnut Veneer is obtained. — A consular report from Persia gives some interesting facts respecting loupe cutting — a trade which has an important bearing on furniture manufacture. The loupe is an excrescence found on walnut trees of great age, and said only to affect trees growing on rocky or mountainous soils. Most of the loupes are exported to France and England, via Russia, and when once they are in the hands of the manipulator in France or England, they are used for veneering purposes. The block is steamed to a very high degree, the effect of which is to render the wood of the substance of cheese. When in that state, a large blade cuts off sheets so thin, that every inch of thickness produces 100 sheets for veneering purposes. The natural designs on the best samples are very beautiful. One loupe has been known to fetch as much as £800. Only walnut loupes are exported; the other trees, such as oak, produce these excrescences. It might be worth while cutting them if the price obtainable in England would be found sufficiently remunerative by the louper. Loupe cutters are mostly Russian subjects who come to these parts accompanied by their special workmen, who bring their appliances with them. At first, loupers were wont to purchase the commodity at the price of two tumans per walnut tree, taking as much as they wished, and either destroying the parent tree, or not, as they chose. The owners of trees, however, discovered the value of the loupes, and the price increased year by year. The louper has more and more difficulties to contend with. The prices having risen so much and the loupes becoming rarer close to the coast, they have to obtain them farther inland, in less accessible places, where wheeled traffic is an impossibility, and where only bullock tracks across the mountains exist. They nevertheless continue working this business, which proves that it yields a fair profit. — *Illustrated Carpenter and Builder.*

Derivation of "Campanile." — One thousand five hundred years ago the first bell, similar in form and composition to the bells of to-day, rang out from the cathedral steeple of Nola in Campania. The wise and pious Bishop Paulinus is its inventor. This explains the fact why the Latin terms for bell are *campana* and *nola*. The legend which tells of Bishop Paulinus's invention of the bell is quaint and beautiful. The sun was declining, as the Bishop strolled thoughtfully through a lovely meadow. Its purple and gold rays dyed the green leaves on the tree-tops. The peacefulness of the hour filled the soul of the holy man with gratitude. He folded his hands and exclaimed: "Be praised, Great Ruler of the Universe, and in this earthly heaven give me a token that you will abide with me until the end of my day!" As he finished his prayer, he heard soft ringing noises round about, and saw the little bluebells, with which the meadow was thickly studded, rock their heads to and fro in the breeze. In memory of this sacred hour Paulinus designed and had made a giant blue-bell, which was hung in the tower of his church in Nola, and henceforth called the faithful to worship. — *St. Louis Post-Despatch.*

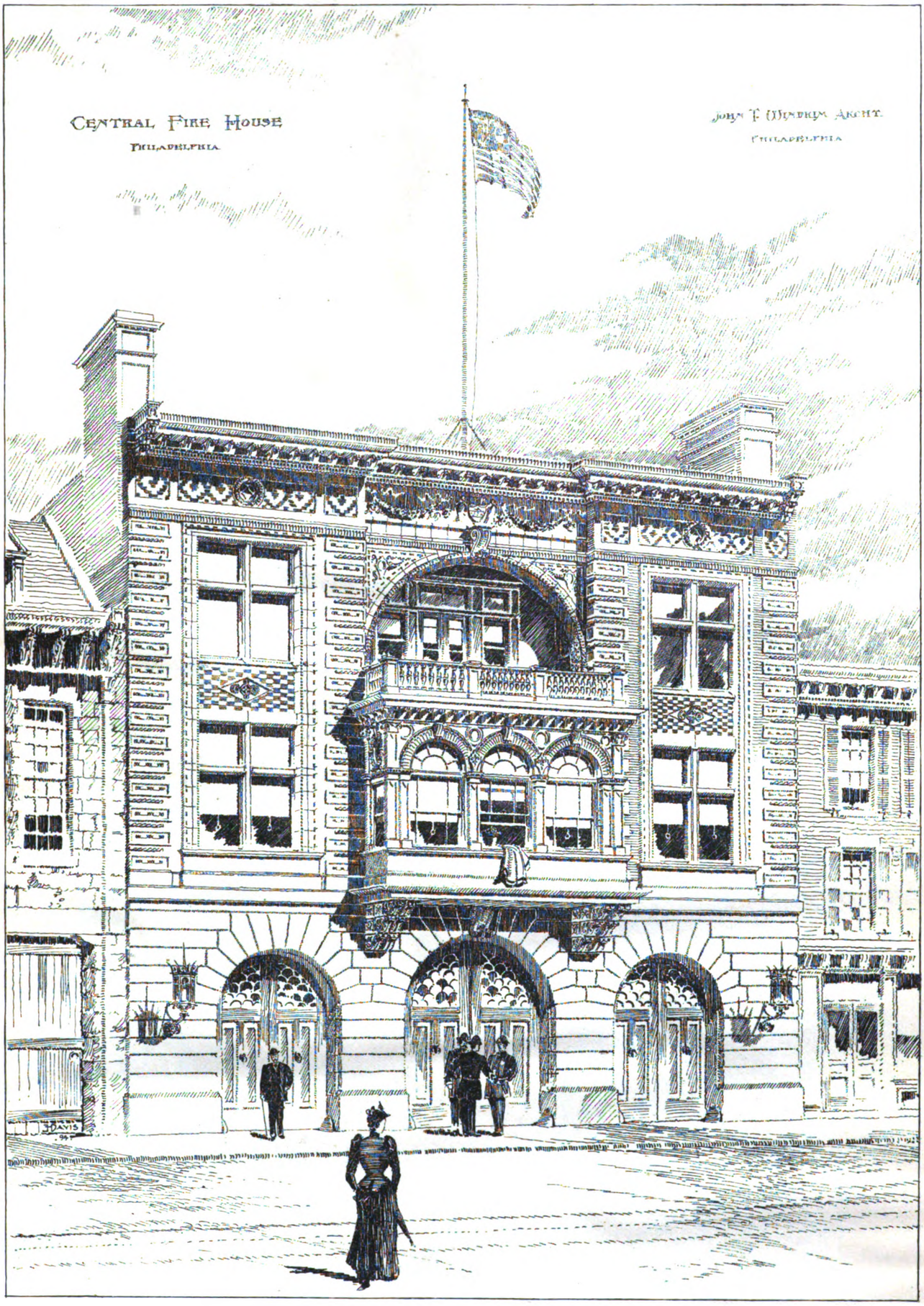
Cleansing Mecca and Medina. — Inasmuch as the holy cities of Medina and Mecca have always been regarded as the hot-beds of cholera, and as the point of departure of those terrible visitations that have scourged not only Europe, but even the United States, it must be a matter of universal relief and congratulation to learn that the Sultan of Turkey has at length yielded to the urgent solicitations of the last international sanitary conference, and is now taking steps for the improvement of the sanitation of the cities where the Prophet was born and buried. He has sent out a special mission to the Yemen, under Marshal Assaf Pacha, to superintend the construction of various establishments for the accommodation, boarding and medical treatment of pilgrims at the holy places. Asylums, hospitals and dispensaries are now being built, the wells are being disinfected and cleansed, the tanks increased in number, and a large and competent staff of doctors stationed at Mecca, Medina, El Thor, and at the Red Sea ports where the pilgrims land. The Sultan is reported to take a keen interest in everything connected with cholera, and is sufficiently "up to date" to abandon those fatalist ways of the old-fashioned Mahometans, who would refuse to administer medicine to the sick, for fear of running counter to divine wishes, or even to remove the flies that settled on the eyes of poor little infants, because "they had been placed there by Allah." — *N. Y. Tribune.*

Modern Foundation-work in Venice. — Visitors to Venice are always interested in the foundations of its houses. How these are formed to support massive buildings rising out of the water is a puzzle. As I saw the foundations of a new palace laid, perhaps I may be allowed briefly to describe the process. First, a strong cofferdam was constructed to keep out the water of the canals. Next, into the bottom thus laid bare were driven wooden piles. The work of driving these is one of the unique sights of Venice. Strong men raise with their arms a heavy hammer that slides on an upright beam, and let it fall on the top of the pile. The leader of the gang meantime keeps singing an old Venetian song, to the music of which the hammer is raised and allowed to fall. The work is very deliberate, as two whole lines are sung whilst the hammer is in the air, and other two before it is raised after it has fallen. It looks to be very slow work, but the men continue thus at it many hours without fatigue. The piles used in this case were beams of oak from 12 to 14 feet long, and a little less than 3 feet in circumference. Of these, 3,000 were used, which were driven, not close together, but leaving irregular intervals between them. Then into these interstices was poured a mixture of cement and stones and water, which formed a mass, solid as stone, in the course of twenty-four hours. The palace is 70 feet high, and the width of this foundation was 9 feet. On this, to the height of 6 feet or so above the level of high water in the Grand Canal, was raised a massive wall of Istrian stone, gradually diminishing in width. Above this were raised the walls, which are of brick, dipped in a solution the invention of the *capo-mastro*, Signor Marco Torres, which makes them resist damp and the weather. These brick walls also taper gradually, until at the top they have a width of only 1½ feet. The whole façade thus becomes to a certain extent a great buttress. In the construction of the old palaces no cement was used, but the piles were driven in, one close to another. Had this old method been pursued in this case, instead of 3,000, 15,000 piles would have been used. The Church of the Madonna della Salute adjoining stands on not less than one million and a half piles. In the old foundations, too, piles were not of oak, but of poplar, pine and various kinds of wood. Away from air and light they do not readily decay. Whole forests of wood are buried beneath Venice, as every building, with the exception of a few side walls of some, stand on piles. The foundations are the most expensive part of a building in Venice, and in the case of this palace they cost about 60,000 francs (2,400*l.*), those of the façade on the Grand Canal costing 20,000 francs alone (800*l.*). The cost of building space on the Grand Canal is at present about 30 francs (1*l.* 4*s.*) a square yard, but elsewhere in Venice only from 4*s.* to 4*s.* 6*d.* a square yard. Of course there is hardly an inch of clear building-ground in Venice (exclusive of garden ground, of which there is a very large amount), and as was the case in this building site, inferior or ruined buildings have first of all to be removed. This palace is not yet finished for occupation, and its erection has taken more than a year. I may add that, as in all buildings in Venice, the floors are laid with a kind of concrete peculiar to the city, which consists of cement and marble broken into small pieces, and of different colors. This is afterwards polished and oiled or waxed, when it presents a clear, smooth and solid surface, shining like a mirror, but a little slippery to walk upon. The ceilings are all left unplastered, and show magnificent beams of wood partly carved, from 40 to 60 feet long, cut from the great giant forests of the Dolomite Alps, which are able to supply Venice now, as they have done for hundreds of years back, with timber for her fleets and palaces. — *Correspondence of the Scotsman.*

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CASINO AT WEST HARTFORD.

F. R. COMSTOCK, ARCHITECT.

HARTFORD, CONN.

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K - BOWLING ALLEY.

FIRST FLOOR PLAN.

BASEMENT PLAN.

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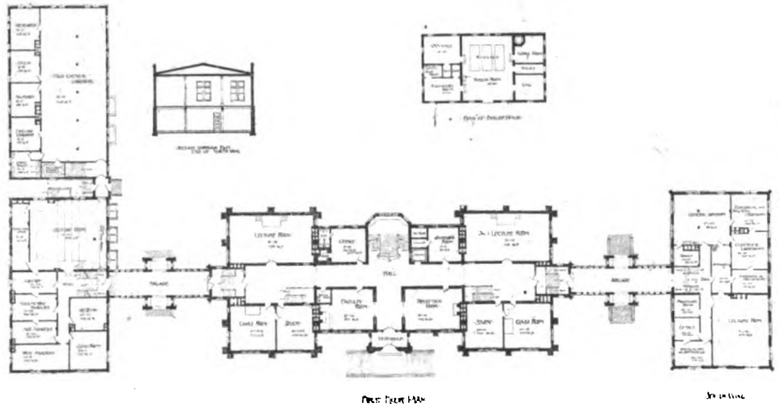
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WM. STILLMAN DUTTON
ARCHITECT

813 SOCIETY FOR SAVINGS
CLEVELAND, O.



: PERSPECTIVE VIEW :
: FROM : CLIFTON AVENUE :

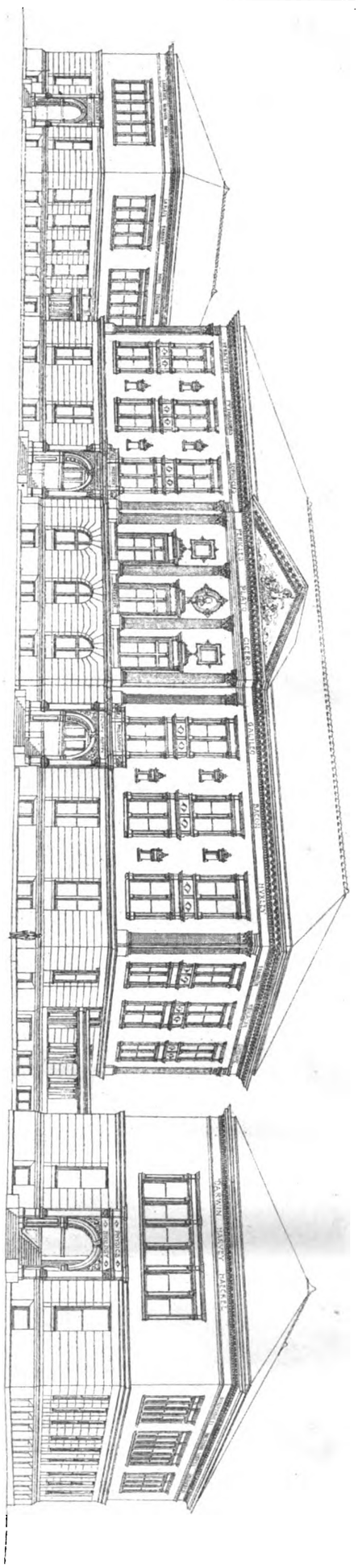


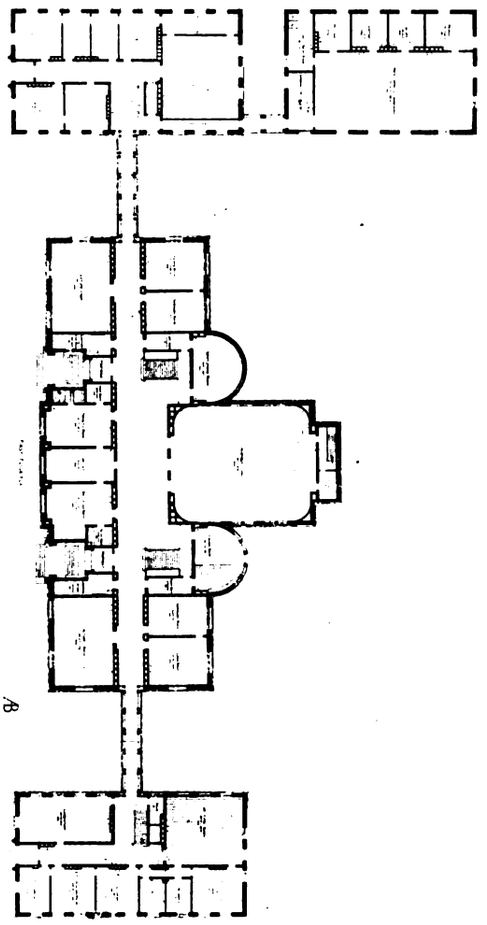
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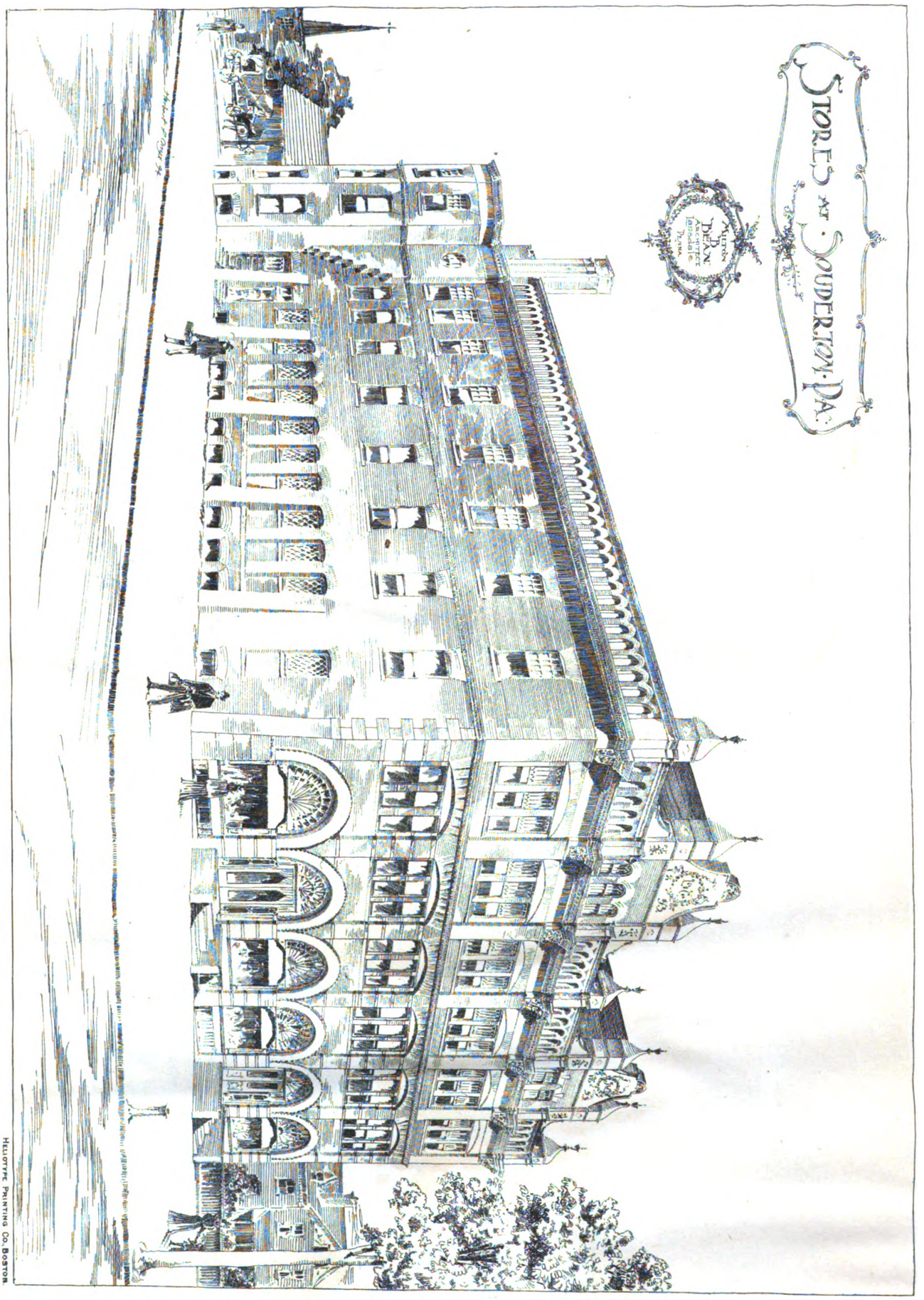
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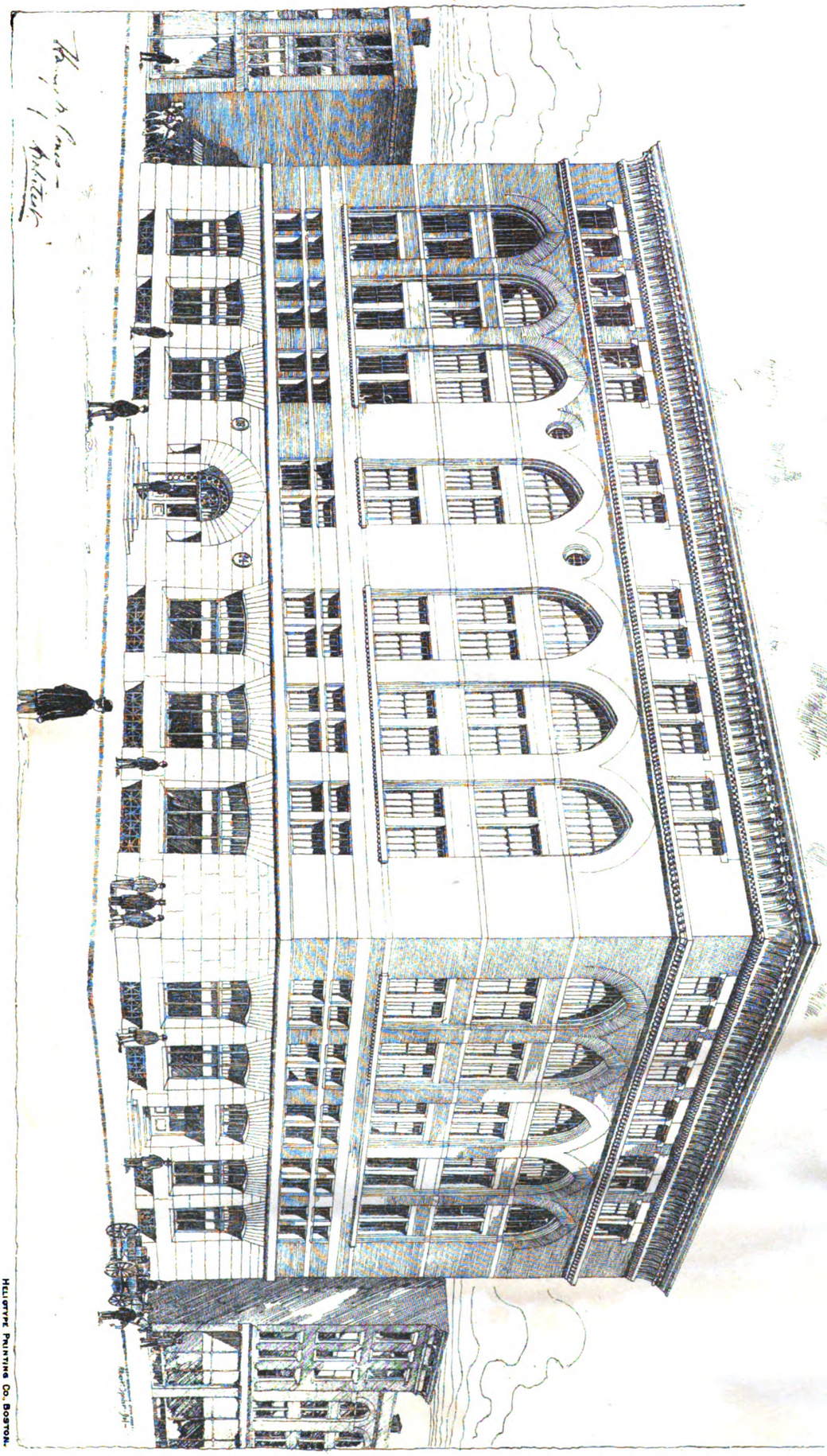


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MAY 5, 1894.

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THE New York *Sun* has an account of the competitive designs for the decoration of the Oyer and Terminer court room in the new Criminal Courts building in New York. It will be remembered that the decoration of this room is the first important enterprise of the New York Municipal Art Society, and the competition instituted by the Society for selecting the designs has certainly been signally successful. Although the work of executing the decoration does not form a very important commission for a painter of distinction, the cost being limited to five thousand dollars, from which is deducted the five hundred dollars advanced in cash as the first prize, designs were received from forty-seven competitors, the list of competitors including the names of such noted artists as Mr. E. E. Simmons, the winner of the first prize, Messrs. C. L. Turner and Walter Shirlaw, who received the second and third prizes, Mrs. Rosina Emmet Sherwood, Mr. Will H. Low, Mr. Henry Sandham and Mrs. Whitman, of Boston, and many others. Judging from what the *Sun* says of them, the competition will have done a good deal to instruct the participants, as well as other artists, in the necessary qualities and limitations of decorative composition, to say nothing of judgment in the choice of subjects. For example, Mr. C. S. Reinhart, whose capacity for effective composition is known to nearly every one, could find nothing better as a decoration for a criminal-court room than a representation of a hanging; while Mr. Arthur B. Davies seems to have felt himself under obligations to strike a blow for socialism, by introducing a procession of personifications of coercion, instinct, autonomism, intelligence, wisdom, industry, justice and so on, typifying, as he explained in his description, the development of the race "from the lower to the most perfect state of intelligence, and happy adjustment of artificial conditions." Mr. Shirlaw's composition, which received the third prize, is exclusively feminine. In the middle are two large personages, which, judging from the *Sun's* illustration, appear to have been intended to typify Conscious Innocence and Cross-examination, but are labelled "Justice and Mercy." On one side of this group is a bevy, or, we suppose we should say, a gang, of three females, of smaller dimensions, who represent, as the inscription underneath says, "Crime," although the *Sun's* rendering of the attitudes and costume suggests rather the consequences of an indigestible lunch at a summer picnic than consciousness of guilt. Naturally, the pendant to this group is formed by another, marked "Law," and representing three fair students, bending over a volume which evidently treats of the moral branch of the subject, as it opens about four feet wide. There is a certain want of scale between the middle group and those on each side, which has been happily avoided by Mr. Simmons, in the design placed first, by setting his central figure, the space for which was fixed by the conditions of the building, on a pedestal, with two supporters at her feet. On each side is a rather formal group of three figures, symmetrically arranged, and representing, as we are told, Liberty, Equality and Fraternity on one side, and Youth, Maturity and Old Age on the other. If there had been room for another group, one would think that Reading, Writing and Arithmetic would have rounded out the series nicely; but there was only a small space above the panels, which Mr. Simmons utilized for two cartouches, containing symbols which the *Sun's* picture leaves somewhat indeterminate. So far as can be judged from such representations, Mr. Simmons's design is at once decorative and interesting, and, apart from details of drawing and coloring, it would be hard to find higher praise for any work of painting applied to building. Mr. Simmons proposes to paint his picture in wax medium, to avoid the gloss of oil, and if subscriptions come in as is hoped, it will be done by the end of the year.

EVERY one who cares for archæological and artistic learning will regret to hear of the death of Mr. Thomas W. Ludlow, the Secretary of the American School of Classical Studies at Athens. Mr. Ludlow was a young man, having graduated from Harvard College in 1882, but his reputation as a scholar has long been established. Before his graduation from college he spent a year in Greece, and never lost the enthusiasm with which he was then inspired. From the time of the establishment of the American School at Athens he devoted himself to its interests, and the studies with which he endeavored to add value and accuracy to his editing of its publications won for him many honors from learned societies abroad, as well as at home.

MOST of our readers have probably heard of the great experimental forestry station and nursery which Mr. George W. Vanderbilt, of New York, is laying out on his country estate in North Carolina; but few of them, probably, are aware that Mr. Vanderbilt has already growing more varieties of trees and shrubs than are to be found in the Royal Botanic Gardens at Kew. The estate includes about seventy-three hundred acres, about half of which is woodland. When Mr. Vanderbilt came into possession, most of this woodland had been for many years ravaged and wasted in the manner characteristic of American forests in general, and of North Carolina forests in particular. The valuable trees had been cut down as fast as they grew large enough to bring the cost of cutting them; the worthless species had been left, to go to seed and drive out the better sorts; the most convenient hillside had been completely stripped for firewood, when it suited the natives to lay in a stock of fuel, and, worst of all, what little effort the valuable vegetation made to recover itself was summarily suppressed by burning over the ground, and then turning in cattle to eat off the tops of whatever little white-oak and maple trees were venturesome enough to show themselves above ground. For the rescue of his land from its present woful plight, Mr. Vanderbilt has, as the *Scientific American* tells us, consulted an expert forester, Mr. Gifford Pinchot, under whose direction it is intended to treat the larger part of the wooded territory as such property would be treated in France or Germany, regarding the trees as a valuable crop, to be judiciously cultivated, and utilized in such a way as to make it produce its due part of the permanent income of the estate; while another portion is to be reserved for an arboretum, in which the constitution, so to speak, of our most valuable native timber trees is to be thoroughly studied, and foreign species, suited to the climate of North Carolina, are to be domesticated, and, if desirable, propagated on a large scale. It is hard to see how Mr. Vanderbilt, whose thoughtful liberality is well known in our profession, could have devised any plan by which he could be of more use to his fellow-citizens. To say nothing of the great benefits which American scientific forestry will derive from the experimental portion of the undertaking, the influence for good upon neighboring proprietors of the sight of a properly conserved private forest — the first in the United States, will be incalculable. It is not many years since a tract of three

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hundred thousand acres of forest land in Virginia was sold in New York, at public auction, for less than one cent an acre. If this is the value set by the present generation on a description of land which would be considered in Germany or Russia as one of the most precious of all possessions, it may be imagined that little less than a miracle will be required to instil proper views of the subject into the existing owners of such territory, and if Mr. Vanderbilt, and his sons after him, succeed in establishing in North Carolina a nucleus of rational forest management, they will have deserved well of their country.

A POINT has come up in London, where a draft of a new Act of Parliament for the regulation of streets and buildings is under discussion, which has, so far as we know, never before been connected with modern building-laws. Most building-laws regulate indirectly the projection of cornices of buildings, by providing that all cornice stones shall balance on the wall, but we have never seen one that absolutely restricted the projection of the cornice. The proposed Act, however, limits absolutely the projection of cornices to two and one-half feet from the face of the wall, whatever may be the style of the building. At a meeting of the Royal Institute of British Architects the other day, Mr. H. H. Statham, the editor of the *Builder*, and an architect of great experience, presented some drawings and figures to show the distressing effect which would be produced by the enforcement of this rule. The Riccardi Palace in Florence, as he had ascertained, had a cornice of nine feet projection; the cornice of the Strozzi Palace projected nearly eight feet, and that of the Guadagni Palace seven feet. He showed a section, at one-fourth the actual size, of the cornice of the Strozzi Palace, with another one, showing it reefed in to conform with the proposed regulation. Of course, it is not necessary to build imitations of the Riccardi Palace in London, but as he reminded his auditors, there is just now an active revival of Classic and Renaissance architecture, and a limitation of the sort would greatly hamper the designers of monumental or public buildings. He thought that the limit should be extended, or that the city authorities should have the right to waive it, in their discretion, so as to admit of the carrying-out of Classical or Renaissance designs of an imposing character. As there are signs that a similar movement for restricting cornices may occur in this country, it will be well for the profession to be on its guard. We have no desire to see the streets of our cities darkened by cornices of undue projection, but our streets are usually wide enough and sunny enough to bear an occasional "cornicione" without harm, and one of the most important aids to noble and dignified effect would be taken from us if projections at the top of buildings were restricted.

A RATHER interesting decision was given the other day in a German court. The purchaser of a house brought suit to have the purchase annulled, and his money paid back to him, on the ground that the seller had knowingly and fraudulently concealed from him the fact that the timbers of the house were suspected of being infected with dry-rot. It did not appear that there was any certainty of it, but it was proved that, some years ago, signs of rot appeared, and a preservative was applied, and that, as the seller knew, there was reason to think that the application of the preservative had not resulted in eradicating the evil. The defendant's counsel claimed that fraudulent concealment could only be claimed in relation to something which it was essential for the purchaser to know, and that it was no part of the seller's duty to inform the purchaser of all the circumstances relating to the property. If this were required, he said, trade, and still more, speculation, would come to an end. The court rejected this plea, saying that, while the argument might be good within certain limits, it did not apply to such a case as that in question. In that there was no question of indifferent circumstances, which it might possibly be useful to the purchaser to know, but of a concealed defect, known to the seller, but not to the buyer, in regard to which the seller must have known that, if the buyer knew of it, he would not take the house. Concealment, or neglect to give warning, of such a defect as this constituted fraud. The defence overlooked the fact that the purchaser, against his wish, had become possessed of a house suspected of dry-rot; and that this had been brought about purposely and craftily by the seller.

THE Royal Museum of Art Industry, at Berlin, is just now occupied by an exhibition of American productions, of which the *Deutsche Bauzeitung* gives a short description, accompanied with a discriminating criticism. Like other foreigners, who have inspected such work in this country, the editor of the *Bauzeitung* finds, in most cases, that the goods shown are not sufficiently American. They have what he happily calls an "American patina," but the substance is, in design, English, or Dutch, or French. He makes, however, an exception in favor of American glass and metal-work. The Tiffany Glass Company, the Bergmann Fixture Company and the Archer and Pancoast Company, of New York, and the Wells Glass Company, of Chicago, are represented by gas and electric-light fixtures which, as he says, are always interesting and characteristic, and, if not always remarkably beautiful, are not ugly. Apart from the novelty of the materials and combinations employed, and, in some of the work, the successful adaptation of natural forms, he observes that the Americans seem to have a faculty of making-over the commonplace artistic forms. Motives which, as he says, in Germany "lie in the streets," simply because they are so old and familiar, are taken by the Americans, and combined in some clever and novel way, so that, while they are immediately recognized, they have a new charm.

AS to the iron-work, the editor of the *Bauzeitung* finds most interesting the elevator cars and enclosures from the Hecla Architectural Bronze and Iron Works of New York. The metal is used in simple forms, usually in thin ribbon, but these are twisted and knotted in such a way as to give an effect which he finds rich and pleasing. American wall-papers and furniture are also shown in the exhibition, but judging from the description, which characterizes the wall-papers as English in pattern, the best work of our designers is not represented. The furniture, when it goes beyond the simplest pattern, is spoken of as English or French, the theatre-chairs which fold up into a space six or eight inches wide, only exciting the critic's admiration.

SOME ingenious amateur photographers among our readers may like to repeat the experiments recently made by M. Boutan, a distinguished member of the Paris Academy of Sciences, in photographing the bottom of the sea. Where an electric arc-lamp could be made available, this would give an excellent light for such photography, but M. Boutan was not able to employ such an apparatus, and took his pictures with the aid of a magnesium flash-light, enclosed in a glass globe, and operated in the usual manner, by pressing a rubber bulb. As, however, the combustion took place under water, it was necessary to supply oxygen for it, and provision was made for the purpose by mounting the flash-light and its globe on top of a barrel, made air-tight, and sunk, by weighting with pig-iron, to the requisite depth. In order to prevent the hydrostatic pressure from injuring the barrel or lamp, a large rubber ball, filled with air, was attached to the outside of the barrel by a tube. As the barrel sank, the rubber ball was compressed by the water, which forced the air contained in the ball into the barrel, so that the equilibrium between the water-pressure outside the apparatus, and the air inside, was constantly maintained. The camera was one of the ordinary detective sort, enclosed in a watertight box, also furnished with a rubber ball for maintaining the air-pressure, and provided with a plate-glass window, in front of the camera lens. This window was colored blue, it having been found that such a tint is desirable to correct the color of the water. The method of exposing the plate is not precisely described in *Le Génie Civil*, from which we borrow this account, but an ordinary pneumatic release, with a long tube, would probably answer every purpose. M. Boutan used finders, apparently inspected through a water-telescope, to ascertain when his camera was directed at a suitable view, but in most cases this would be impracticable, and the operator would have to depend on having his camera hang level just above the bottom. Two of M. Boutan's photographs, one taken by daylight, at a depth of sixteen feet, and the other by magnesium light, at a depth of about thirty feet, are reproduced in *Le Génie Civil*, and, while they do not show anything more wonderful than sand and stones and seaweed, they are quite clear, and it is conceivable that, out of a considerable number of negatives, some might show episodes of submarine life which would be of great interest.

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STYLE.[1]—II.

WE beg the reader's pardon for this too lengthy digression; let us now seek out, among philosophical artists, those who have exercised the most potent influence on their period and analyze their works. These are: Ruskin, in England, and Semper, in Germany.

The artistic philosophy of Ruskin rests on the two elements in man, the ideal and real; he is thus enabled to keep within the limits of the just, escape the errors of imagination and shun the vulgarity of materialism. He premises that man is subject to the laws of toil, of sorrow and of joy, and shows that his senses which react under the sway of these three laws, owing to the choice that is left to him of the path traced between the two factors put at his disposition, permit his passions to have a noble side and a base side. It is, he says, the rôle of art to make one appreciate healthy enjoyments in the order of the senses. Lawrence Harvey, a member of the Royal Institute of British Architects, notes, in a work on Ruskin, that the foundation of honesty which forms the basis of artistic criticism allows him to give his hand to Henri Labrouste.

Ruskin begins with this dictum: know what you have to do and do it. In fact, failure is more often attributable to a confused understanding of the thing to be done than to the insufficiency of means. Hence, the first thing to seek in architecture is the principle around which consequences are grouped. These fundamental principles Ruskin calls "the lamps of architecture," and he indicates seven of them: the lamp of sacrifice, the lamp of truth, the lamp of power, the lamp of beauty, the lamp of life, the lamp of memory, the lamp of obedience.

The *lamp of sacrifice* is the unreasoning spirit, which employs for works of an elevated order, such as temples, tombs and palaces, the most precious materials, without ostentation, but as an offering of that which one esteems most highly; and this costly material is to receive from man's hand work proportioned to its value.

The *lamp of truth* is the spirit that scorns all falsehood, either in the nature of the materials, or in their use, or in the destination of the edifice itself. This is the price of the nobility of architecture.

The *lamp of power* belongs to the natural world, while the first two pertain to the moral order. The power of nature lies in the severe majesty of the phenomena which she offers us and in the contrasts which comparison brings out between the size of the principal and the minor importance of the secondary.

The *lamp of beauty*, says Ruskin, can be lighted only at Nature's sources, and all human works are unworthy of the name "beauty"; therefore, he criticises trophies, vases and even wreaths, which, he says, are works of man.

Ruskin seems to us to carry his scorn for human productions somewhat too far.

The *lamp of life* is the peculiar expression given to every part of an edifice, to make one comprehend the existence of the person whom it shelters, and Ruskin, extending this theory, advances the statement that the most powerful element of life, in architecture, is the irregularity and necessary imperfection of certain parts.

The *lamp of memory* is that solidity bestowed upon architecture which enables it to recall to future generations the memory of their ancestors. We regret, here also, that the author makes no reservation. This solidity, which must be given to temples, would seem to us inappropriate for any edifice whose use would be liable to be modified with social progress.

The *lamp of obedience*. Here Ruskin has dreamed of a single national school of architecture, as, he says, we have but one national tongue; and he makes vigorous opposition to what he styles individualistic anarchy; finally, he pronounces himself in favor of adopting in England a Gothico-Lombardo-Venetian style, which seems to him best adapted to the genius of his country; and to this style every artist should render obedience. We fear that, thus fettered, artistic flight would become at once impossible among our erudite neighbors.

Let us seek to learn the secret of the artistic aspirations of another great nation of the North. The study of the works of Semper will reveal the philosophical ideas of Germany on architecture.

After remarking that notions of art have developed among the different people simultaneously with the ideas of liberty and with national sentiment, Semper takes as the starting-point of his critical analysis of architecture the monuments of antiquity; he shows the intimate relationship between construction, sculpture and painting existing in Egyptian, Greek and Roman architecture; but he proclaims the hegemony of architecture over the other arts, in order to preserve the *unity* necessary to the character of the work. Semper adds that this fraternization of the three arts continued down to the Gothic of the fifteenth century. Passing then in review the ancient monuments, Semper declares in favor of Greek architecture, the only means, he thought, of lifting Germany above other nations, the only architecture which we were to interpret and adapt to our needs. In that way, reasonable *beauty* proceeding from the *true* would be obtained, without making a copy of Pagan architecture; such an imitation would remain expressionless among modern nations, whose *manners* are so different from those of the ancients and whose needs are wholly unlike theirs. *Proportion of forms*, the use of *sober sculpture* and *decorative painting* upholding these forms, giving to the shadows and lights play of infinite charm and bringing out the *essential parts of the construction* are the resources to which the architect must turn to animate the stone and impart life to his work. It is only, says this able critic, at a less noble period, that prominent projections covered over with carving were admitted into the interior of monuments to conceal the bareness of the walls without giving the forms—left aimless—any greater appearance of conformity to their *destination*. Sculpture, when simple, is an accompaniment of the chief form and adds to its value; if allowed to hide it, it detracts from its *power*. Semper criticises paintings in frames, having no well-defined aim, as strongly as he praises the use of decorative painting; he is also radically opposed to the introduction of mosaics into mural ornamentations and would restrict their use to pavements. Architecture, he observes, is of no account except in its object, and this object varies with the monument; architecture cannot, therefore, be fixed in its forms, its *destination* depending upon variable *needs*, while its *principle*, based on humanity, remains constant; lastly, the materials must find a *natural* application in the structure. As the result of his study of antique monuments, especially of the Greek, Semper came to prefer this last-mentioned architecture to all others; unfortunately, without taking into account his teachings, those who have followed his doctrine have not always apprehended its philosophical bearing and have made it *absolute;* thus they stifled for a long time in Germany all the original impulses of official architecture, and they are open to the charge of an almost complete disregard for comfort. But we must not make Semper responsible for the errors of those who have but imperfectly interpreted him. However this may all be, although Semper's doctrines may have exercised a considerable influence on the architecture of his country, it has not been felt on private edifices; these have retained their national character and have continued to draw inspiration from the Gothic and from the German Renaissance.

[To be continued.]

[1] From the French of Léon Labrouste, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 957, page 40.

THE ITALIAN RENAISSANCE.[2]—II.

HINTS TO TRAVELLING STUDENTS.

BETWEEN Naples and Rome there is very little of interest to the student of the Renaissance. Indeed, there are not many routes of the same length (154 miles) between important Italian centres, which pass through so few places of architectural interest. Northern and central Italy seem always to have been regions of more intense life and activity, both intellectual and political, than the southern half of the peninsula. This is even true of Classic times, if we except the Neapolitan territory and some parts of Magna Græcia, including Sicily.

After leaving Caserta the architect will hardly find it worth his while to "stop off" on his way to Rome, except at Capua and Monte Cassino, and at these points he will find the chief interest to lie in the ruins of the two great Roman amphitheatres which they possess, and not in any Renaissance monuments of importance. It is true, one may find in nearly every Italian town or village, vestiges of the predominant bad taste of the decadence of the seventeenth and eighteenth centuries, in the form of church-façades of uninteresting design or the far worse stucco abominations with which the sanctuaries, or whole interiors, of many of the new or old churches of that time were disfigured. Occasionally one may encounter an arcade, a court-yard, a doorway, or a façade of genuine

[2] Continued from No. 957, page 41.

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elegance of design, well worth a thumb-nail sketch or a snap of the kodak, though unnamed in the guide-books. But these "finds" are the exception: "when found," they should certainly be "made a note of." Three and a half months, however, will leave very little time for out-of-the-way explorations, if one is to study the great monuments of the Renaissance with any care or detail.

The tourist in search of novel experiences, may, however, care to spend a night with the monks of the Monte Cassino theological seminary, where he will receive gratuitous hospitality in true mediæval fashion. Baedeker promises him comfortable lodging, but scanty fare, and whispers in his ear that the gratuitousness of the hospitality should be recompensed with a proportionate gratuity at the average hotel rates. This is, perhaps, a low price to pay for so unique an experience, especially as that includes an unusually fine and extensive prospect of the Garigliano Valley. The church was built in 1727.

Omitting here any reference to Frascati with its villas and its Roman ruins, we come at once to Rome, in which a stay of nearly four weeks is scheduled for the class.

The influence of the Renaissance, which originated in Florence, had already filled the cities of Tuscany and Lombardy with buildings of great beauty and singular grace and originality of conception before it made itself felt in the architecture of the Eternal City. The Popes had returned to Rome from Avignon; the Humanistic movement had reached the Pontifical circles, and Brunellesco, Alberti and Donatello had already carried back to Florence the inspiration which they had drawn, in copious draughts, from the fountain-heads of Classic art in the ruins of the ancient city, where, in 1450, Pope Nicholas V, himself a Humanist, conceived the scheme of rebuilding the crumbling church of St. Peter's — the first stirring of the renaissance of architecture in Rome. The scheme was not realized; but during the pontificate of Sixtus IV (1471–1484), several important works were carried out in the new style; notably the palaces of Venice by Alberti (1404–1472) and Pintelli (——1490), the façade of S. Pietro in Vincoli and the Sistine Chapel of the Vatican. Important as are these works as marking the advent of the Renaissance to Rome, they are far inferior to the palaces and churches erected in Florence, Pavia, Bologna and Venice at the same or even much earlier dates.

It was the coming of Julius II to the papal throne and the summoning to Rome of Bramante (1444–1514), Peruzzi (1481–1536) and Michael Angelo (1475–1564) that laid the foundation for the glories of modern Rome. From 1503, when Bramante arrived from Milan, on until the Decadence, Rome was the focus of Italian architectural activity, hardly interrupted even by the invasion of Charles VIII of France. All the great names among the cinquecento architects are represented here except Palladio and Scamozzi: and what a brilliant roll they make! Bramante, Peruzzi and Raphael; Giuliano and Antonio da Sangallo; Michael Angelo, Andrea Sansovino and his pupil, Giacopo Tatti, afterwards so famous for his works in Venice; Vignola, Ammanati, Pirro Ligorio and Della Porta; Martino Lunghi and Domenico Fontana; each of these has left his impress upon the aspect of the city, in most cases by a masterpiece, or several of them; while most of them were at one time or another associated in the building of St. Peter's and the Vatican. Then succeeds, with the advent of the seventeenth century, the period of decline. The terrible trio, Bernini, Maderno and Borromini, high-priest he of Jesuit monstrosities, perpetrated their various architectural crimes or platitudes, followed or partly accompanied by less conspicuous and more inoffensive designers like Carlo and Girolamo Rainaldi, and di Rosso; Nic. Salvi, Ferdinando Fuga, and Alessandro Galilei in the eighteenth century.

The Renaissance monuments of Rome divide themselves into two main classes; those which constitute complete and independent structures, and those which are merely parts or modifications of older buildings. In secular architecture the former class predominates; in ecclesiastical the latter, especially in the seventeenth and eighteenth centuries. There is hardly an early Christian basilica that was not "done over" during the Renaissance or the Decline. Some of the most beautiful work of the Roman cinque-cento is to be found in the new ceilings, façades, porches or chancels of older churches, in chapels added to them, or in tombs and monuments erected within them. On the other hand, the most shocking atrocities of the Jesuit Borrominesque style are found disfiguring the interior or the façades of early churches worthy of a better fate. In the appended lists only a very small proportion of these alterations and minor works can be given, and only the most important of the many scores of palaces and larger dwellings with which the Renaissance enriched Rome.

In Rome were developed and brought to their highest perfection the two most characteristic features of the Italian Renaissance, the court-yard surrounded by arcades, and the dome with a lantern over the intersection of nave and transept. The earliest arcades of the Renaissance are found in the cloisters of Florentine monasteries, and their prototypes are seen in the celebrated and picturesque Roman cloister-arcades of St. John Lateran and St. Paul beyond the Walls — works of the thirteenth century. All the earlier arcades consist of arches carried by columns; they are light and graceful, but lacking in strength and constructive propriety. The arches with the spandrels and wall they sustain can be but little, if at all, thicker than the upper diameter of the shaft of the columns, which makes them look lean and poor; while the columns are incapable of resisting the outward thrust of the arcade-vaulting, and recourse must be had to tie-rods of iron, a pitiable and disfiguring makeshift, to hold it together. The Roman arcades — those, at least, built subsequent to 1510, and many of earlier date — are of the antique Roman type, the arches being supported by massive piers fronted by decorative columns or pilasters carrying complete entablatures above the arches. The revival of the antique style of arcade made it possible to dispense with tie-rods and to give the arch-soffits the necessary depth and massiveness. The Farnese court-yard is the finest example of this kind, as that of the Cancelleria is of the earlier type. In Roman court-yards, moreover, the arcades rarely carry the façades of the court, which are set over the rear walls of the galleries, as in Milan and Bologna.

The dome crowned by a lantern was undoubtedly an invention of Brunellesco's, but reached its highest development in Rome, not Florence. The domical churches and chapels of Rome are legion, and there are very few among them, even of late date and otherwise inferior design, which are not worthy of some attention and study for the beauty and elegance of their domes. They form an extremely picturesque feature of the panoramas of the city from almost every point, the superb and unrivalled cupola of St. Peter's being everywhere visible, overlooking them all.

The architectural student can, furthermore, acquaint himself better in Rome than anywhere else with the possibilities and properties of the Classic orders as elements in monumental design, both for interior and exterior architecture. In no other city are they handled with more taste, refinement and skill, better composed, or treated with greater correctness, variety and appropriateness. On the other hand, the best examples among the palace façades of Rome are object-lessons in the supreme value of fine proportions, carefully profiled mouldings and cornices, and skilful fenestration as resources for architectural effect without recourse to any use of the orders or of elaborate detail and applied decoration.

Architectural landscape-gardening also, to the importance of which we Americans are at last beginning to open our eyes, may be studied to advantage in the splendid gardens of the Villa Borghese and the Vatican, while, among examples of modern architecture, the monument to Victor Emanuel and the new Museo Nazionale are well worth more than one visit.

Bibliography. — This is extensive for the period of the Renaissance, and still more so for the antique city. In the former category it is doubtful if anything will ever supersede the two monumental works of P. Letarouilly, "*Edifices de Rome Moderne*," 3 vols., folio, of plates and 1 vol. 4to of text — the latter hardly less interesting and valuable than the plates — and "*Le Vatican*," a huge portfolio of plates without text. Both these works have long been out of print, and are costly (especially the second named) when they can be found at all on the market. But they can be studied in the larger libraries, and no student should fail to go through them carefully if he would learn anything about the Italian Renaissance, or expects to visit Rome itself. They are unsurpassed among architectural works for the delicacy, minuteness and fidelity of the engravings, and the suggestiveness and vivacity of the text — a veritable mine of historical and critical information.

Another excellent French work, but much smaller, is Percier and Fontaine's "*Palais et Maisons de Rome Moderne*," 1 vol., folio, of plates, and its companion, "*Maisons de Plaisance des Environs de Rome*," by the same authors.

Other illustrations of Renaissance monuments may be found in the heliotypes of the Schutz portfolios, "*Die Renaissance in Italien*," while nearly all the more important among them are described and a few illustrated, in Lübke's "*Geschichte der Architektur*," pages 705-742, and Fergusson's "*History of Modern Architecture*," new edition (1892). See also Palustre's "*L'Architecture de la Renaissance*," first book, and Gwilt's "*Encyclopædia*," Part First. Peyer Im Hof has elevations of many of the palaces and churches; and Tosi and Becchio's "*Altars, Tabernacles and Tombs*" illustrates a number of important sepulchral monuments in various churches.

Among guide-books one may mention, besides Baedeker and Murray, A. J. C. Hare's "*Walks in Rome*," a bulky and inconvenient volume for the tourist, full of quotations and annotations, but not especially useful to the student of Renaissance architecture. Of the two standard guide-books, Baedeker's is the more compact and superior in its copious tables, lists and admirably clear and accurate maps and plans. Its arrangement is topographical; Murray's is topical — palaces, churches, museums, etc., being described in groups, making it very convenient for reference to given subjects.

On ancient Rome the books are legion; I will only mention two handy volumes for the student, Lanciani's "*Ancient Rome in the Light of Recent Discoveries*," 1 vol., square, 8 vo.; and Middleton's "*Ancient Rome in* 1888," 1 vol., 8 vo.

The following list of monuments of the Renaissance in Rome is largely based on Letarouilly; it does not pretend to be by any means complete, much less exhaustive, but enumerates all the most celebrated examples and a number of those less famous besides. Obviously another person might select these quite differently, and there are scores and hundreds of minor works which the student will see and admire.

For the sake of convenient reference I have grouped them according to the character of the building: first, the religious monuments, then the palaces and villas, and finally, fountains and decorative works, each list being arranged in an order at least approximately

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chronological. In the case of buildings erected partly in one and partly in another period, or several times restored and altered, it has been thought best to group in parentheses the successive alterations, and then to repeat these in their proper chronological sequence.

I.—CHURCHES OF THE RENAISSANCE IN ROME.

A. CHURCHES OF THE FIFTEENTH CENTURY.

1. SANTA MARIA DELL' ANIMA: erected 1400, but remodelled 1500-1514 by *Giuliano da San Gallo*, and quite recently "restored" internally (see below).
2. SANTA SABINA: a Mediæval basilica of the Early Christian type, with antique columns, partly modernized in 1441 and again in 1587.
3. SANTA MARIA IN TRASTEVERE: a twelfth-century basilica remodelled in 1450 by *Bernardo Rosellini*.
4. SANTA MARIA IN ARA CŒLI: another Mediæval basilica with ancient columns, restored in 1464 and adorned with a rich ceiling about 1590; several tombs and paintings of the fifteenth century.
5. SAN MARCO, (connected with the Palazzo di Venezia): an ancient basilica remodelled in 1468 with a new ceiling and a handsome vestibule, perhaps by *Giuliano da Majano;* further altered internally in the seventeenth and eighteenth centuries.
6. S. PIETRO IN MONTORIO: the first complete Renaissance church in Rome in 1472; usually attributed to *Baccio Pintelli* (altar-piece by *Vasari;* in court, the famous Tempietto of *Bramante*).
7. SISTINE CHAPEL OF VATICAN: 1473, by *Giovanni dei Dolci* (usually attributed to *Baccio Pintelli* [Letarouilly]); vestibule added in 1702, by *Carlo Fontana*, and interior revamped about 1870.
8. S. PIETRO IN VINCOLI (Basilica Eudoxiana): vestibule by *Baccio Pintelli*, 1475; interior several times remodelled; cloister by *Giuliano da San Gallo*, 1500.
9. SANTA MARIA DEL POPOLO: another work of *Pintelli*, dated 1475-77; interior "adorned" by *Bernini* about 1640 (?); especially remarkable for its early dome, its chapels and magnificent monuments, mainly of the fifteenth century, besides those by *Andrea Sansovino*, about 1537; and for its paintings. The Chigi Chapel is attributed to *Raphael*.
10. S. GIACAMO DEGLI SPAGNUOLI: 1480, by *Baccio Pintelli*.
11. S. AGOSTINO: 1483 by *Baccio Pintelli* (?) or *Giacomo da Pietra Santa;* remodelled in 1750; its dome said to be the earliest in Rome.
12. SANTA MARIA DELLA PACE: 1484 or 1487, by *Baccio Pintelli;* cloisters added 1504 by *Bramante*, and façade, 1660, by *Pietro da Cartona;* interesting for its fifteenth-century altar, sixteenth-century chapel and monuments, and especially the frescoes and paintings by *Peruzzi* and *Raphael*.

B. CHURCHES OF THE SIXTEENTH CENTURY.

(FACADE OF SANTA MARIA DELL' ANIMA: by *Giuliano da San Gallo*, 1500; see 1.)
(CLOISTER SAN PIETRO IN VINCOLI: by *Giuliano da San Gallo*, 1500; see 8.)
(CLOISTER SANTA MARIA DELLA PACE: by *Bramante*, 1504; elegant use of colonnade over arcade.)
(CIRCULAR CHAPEL OR TEMPIETTO, by *Bramante* in Court of San Pietro in Montorio, 1504; see 6.)
13. SANTA MARIA DI LORETO: 1507, by *Antonio da San Gallo*, the younger; a fine dome, with lantern; conspicuous in view of the Forum and Column of Trajan.
14. SAN LORENZO IN DAMASO: incorporated into the Palace of the Cancelleria, 1508, by *Bramante;* interior revamped 1820 and 1873.
15. SANTA MARIA IN DOMNICA: portico added to ancient basilica by *Raphael*, 1515, and grisaille frieze painted by *Giulio Romano* and *Perino del Vaga* about the same time.
16. SAN SPIRITO IN SASSIA: 1538, by *Ant. da San Gallo*, the younger; façade about 50 years later by *Mascherino;* elegant Renaissance campanile.
17. CHAPEL OF SAN ANDREA FUORI LE MURA: 1553, by *Giac. Barozzi di Vignola*. (A smaller chapel of Saint Andrew stands not far from this, built nearly 100 years earlier, under Pius II.)
18. SANTA CATERINA DEI FUNARI: 1563, by *Giacomo della Porta*.
19. SANTA MARIA DEGLI ANGELI: the tepidarium of Diocletian's Thermæ converted into a church by *Michael Angelo*, in 1563, one of his last works; he also added the cloisters in the same year. Nearly 200 years later *Vanvitelli* remodelled the church much to its injury.
20. THE GESU: 1568, by *Vignola* and *Della Porta*; a domical church showing the influence of the design of St. Peter's; exceedingly rich interior stucco-work and paintings.
21. SANTA MARIA SCALA CŒLI: 1570, by *Vignola* and *Della Porta*.
(SAN SPIRITO IN SASSIA, façade by *Ottavio Mascherino*, 1585; [Letarouilly says 1570]; see 16).
22. SANTA MARIA IN VALLICELLA, also called the CHIESA NUOVA: 1550 (1575 Letarouilly) by *Matteo di Città del Castello;* interior by *Martino Lunghi*, the elder. Rich stucco-work and paintings; chapel of San Filippo Neri the founder; seventeenth-century sacristy, oratory and cloister, by *Borromini;* façade, 1620, by *Fausto Rughesi*.
23. SANTA MARIA IN ARA CŒLI: an ancient basilica remodelled in 1575, and several times altered subsequently; several rich monuments, chapels and paintings.
24. SAN GIOVANNI IN LATERANO: transeptal façade in 1856, by *Domenico Fontana*. The transept altered, 1600, by *Della Porta*, and the nave remodelled and atrociously disfigured in 1650 by *Borromini*. The imposing main façade was built in 1734 by *Alessandro Galilei;* the sanctuary enlarged in 1875-80. The ceiling is fine; it was probably designed either by *Michael Angelo* or *Della Porta*, and is perhaps the earliest of the visible "restorations" effected here by the Renaissance; the still earlier alterations of the building itself in 1430 having disappeared under Borromini's work. One or two early Renaissance monuments, however, are still to be seen, as well as some of the ancient mosaics and Mediæval frescoes. The visitor should not fail to examine the beautiful thirteenth-century cloisters, which reveal strikingly the persistence of Classic forms in Rome throughout the Middle Ages.
(SANTA SABINA, remodelled 1587; see 2.)
25. SAN GIOVANNI DEI FIORENTINI: begun early in the century from designs by *Giacopo Sansovino*, but mainly the work of *Michael Angelo* and *Giacomo della Porta* (1588); façade added 1734, by *Ales. Galilei*.
26. SAN LUIGI DEI FRANCESI: 1589, by *Giacomo della Porta*.
27. SANTA MARIA MAGGIORE: one of the most splendid of the ancient basilicas and least disfigured by modern alterations. The magnificent ceiling was designed by *Giuliano da San Gallo*, and gilded with gold from the newly discovered western world. The two rich domical chapels, the Sistine and the Borghese were added in 1590 (*Dom. Fontana*) and 1611 (*Flaminio Ponzio*), rear façade 1670 by *Carlo Rainaldi;* the rest of the exterior, including the façade, by *Ferdinando Fuga*, in 1743.
28. SANT' ANDREA DELLA VALLE: 1591, by *P. Paolo Olivieri;* continued by *Carlo Maderno*, and the façade added 1670, by *Carlo Rainaldi*.

C. CHURCHES OF THE SEVENTEENTH CENTURY.

(TRANSEPT OF SAN GIOVANNI IN LATERANO, remodelled by *Della Porta*, 1600; see 24.)
(BORGHESE CHAPEL OF SANTA MARIA MAGGIORE, 1611, by *Flaminio Ponzio;* see 27.)
29. SANTA MARIA DELLA VITTORIA: 1605, *Carlo Maderno*.
30. SAN CARLO AL CORSO: 1612, by *Onorio Lunghi;* façade, 1690, by *Menicucci*.
31. SANT' ANDREA DELLE FRATTE: 1612, *Giovanni Guerra;* dome and tower by *Borromini*, 1650; façade by *G. B. Soria*, 1630, restored by Valadier, 1826.
(FACADE SANTA MARIA IN VALLICELLA, 1620, by *Fausto Rughesi;* see 22.)
32. SAN CARLO, ALLE QUATRO FONTANE: 1640, *Francesco Borromini*.
33. SS. VINCENZO ED ANASTASIO: 1650, *Martino Lunghi*, the younger.
34. SANT' AGNESE ON PIAZZA NAVONA: 1650, by *Carlo* (or *Girolamo* [Letarouilly]) *Rainaldi;* façade by *Borromini*—a very reprehensible design.
(ORATORY AND CLOISTER OF SANTA MARIA IN VALICELLA, by *Borromini;* see 22.)
(NAVE SAN GIOVANNI IN LATERANO, by *Borromini*, 1650; see 24.)
(FACADE SANTA MARIA DELLA PACE, by *Pietro da Cortona*, 1660; see 12.)
35. SANTA MARIA DEI MIRACOLI:
36. SANTA MARIA DI MONTE SANTO: } 1662, by *Carlo Rainaldi, Lorenzo Bernini* and *Carlo Fontana;* domical churches (one of them an elliptical, the other an octagonal plan) flanking the entrance to the Corso.
(SANTA MARIA MAGGIORE, posterior façade by *Carlo Rainaldi*, 1670; see 27.)
(SANT' ANDREA DELLA VALLE, façade, 1670, by *Carlo Rainaldi;* see 28.)
(FACADE OF SAN CARLO AL CORSO, 1690, by *Giovanni Menicucci;* see 30.)

D. CHURCHES OF THE EIGHTEENTH CENTURY.

(SANTA MARIA IN TRASTEVERE, façade and vestibule, 1702, by *Carlo Fontana;* see 3.)
(SAN PIETRO IN VINCOLI, remodelled in 1705 by *Francesco Fontana;* see 8.)
37. SANTA MARIA IN COSMEDIN: restored, and façade added in 1718, by *Giuseppe Sardi*.
(SAN GIOVANNI IN LATERANO; main façade, 1734, by *Alessandro Galilei;* see 24.)
38. SANT NOME DI MARIA: 1738, by *Antoine Drizet;* the first *Pensionnaire de Rome* of the French Academy of Fine Arts, near the Church of Santa Maria di Loreto; see 13.
(SANTA MARIA MAGGIORE, interior cleared of Mediæval additions, main façade and exterior walls rebuit, 1743, by *Ferdinando Fuga;* see 27.)
39. SANTA CROCE IN GERUSALEMME: façade and interior, 1744, *Domenico Gregorini*.

E. THE CHURCH OF SAINT PETER (SAN PIETRO IN VATICANO).

The first steps towards the erection of a church in place of the ruined early Christian basilica were taken in 1450-55 by Pope Nicholas V, for whom *Bernardo Rosselini* erected the tribune of a new basilica. The work ceased on the Pope's death, and the present church represents a wholly new project, first conceived by *Bramante* for Pope Julius II. The outline chronology of this, the most imposing monument of the Roman—indeed of the Italian—Renaissance, is given below.

The student is referred to the magnificent plates, unfortunately without text, of Letarouilly's "*Le Vatican,*" to be found in the larger and richer public libraries; to Symond's "*Life of Michael Angelo,*" recently published, and his "*The Renaissance in Italy: the Fine Arts;*" to the work of Domenico Fontana (who completed the dome) entitled "*Templum Vaticanum;*" a rare work, to be found in the larger libraries only; and to the histories and hand-books of Lübke, Fergusson (who, however, makes the great mistake of giving as Bramante's, a plan really due to Raphael), Palustre, Murray, whose sketch of the history of the building is admirable, and Baedeker; to Burckhardt's "*Cicerone*" and the works of Müntz and Geymüller.

CHRONOLOGY OF ST. PETER'S.

1506. Foundation-stone laid, under present pier of St. Veronica, for construction of *Bramante's* design: four equal apse-ended arms, with domical chapels and vast central cupola.
1514. *Raphael* called to superintend work. Proposes conversion of plan into five-aisled Latin cross. *Fra Giocondo* and *Giuliano da San Gallo* associated with him.
1518. *Antonio da San Gallo*, the younger, called in to assist and
1520 becomes, on Raphael's death, director of the works with *Baldassare Peruzzi*. The failure of Bramante's piers necessitates their strengthening by additional masonry. Two designs successively proposed and abandoned; Peruzzi's simplifying Bramante's and establishing the eastern front as the chief façade; and San Gallo's adding a narthex and two campaniles, changing also the external ordonnance.
1534 (?) Wooden model of San Gallo's design executed by *Antonio Labaco;* still preserved in one of the chambers in the piers.
1546. On the death of San Gallo (Peruzzi having died in 1536), *Michael Angelo* is placed in charge of the work. The plan further simplified and restored somewhat in the direction of Bramante's original conception; the dome designed and carried up as far as the drum, which was partly completed.
1564. Michael Angelo, dying, is succeeded by *Vignola*, who completes the lanterns in front of the dome, and by whom, with *Pirro Ligorio*, the dome is carried on upon Michael Angelo's lines.
1573. Death of Vignola. The work taken up by *Giacomo della Porta*, Vignola's pupil, who modifies Michael Angelo's profile for the dome, making the curve steeper, and brings it nearly to completion. He designs the mosaics for the interior of the dome and its pendentives.
1601. Death of Della Porta; accession of *Domenico Fontana*, by whom the dome and lantern are finally completed.
1603. The nave lengthened by the addition of two new bays and alteration of the terminal bay of Michael Angelo's design by *Carlo Maderno*. The new façade completed in 1612 by the same architect.
1628. The building consecrated by Pope Urban VIII.
1629. *Bernini* becomes master of works, but does little of consequence until
1661 when he builds the magnificent colonnades and corridors flanking the Piazza San Pietro.
1776. Building of the present sacristy or Sagrestia Nuova by *Carlo Marchionne*.

Under Pius IX, the final touches were completed on minor details previously neglected.

The *monuments* in St. Peter's are mainly the work of the period of the Decline, and need not be specially mentioned here. A. D. F. HAMLIN.

MODERN ASYLUMS FOR THE INSANE.[1]—IX.

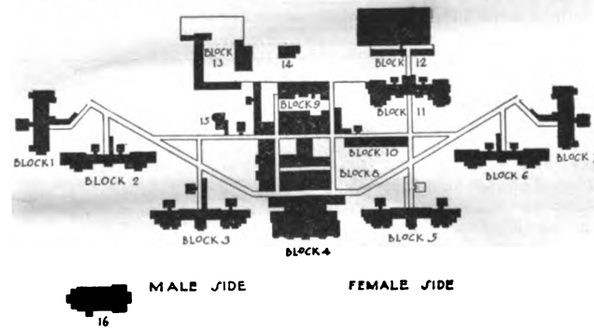


Fig. 1. West Riding Asylum (Menstone).

1. Epileptic Block, Male.
2. Recent and Acute Block, Male.
3. Sick and Infirm Block, Male.
4. Administrative Block.
5. Sick and Infirm Block, Female.
6. Recent and Acute Block, Female.
7. Epileptic Block, Female.
8. Recreation and Dining Hall.
9. Stores, etc.
10. Nurses' Residences.
11. Laundry Ward.
12. Laundry Block.
13. Workshops and Yard.
14. House.
15. Attendant's House.
16. The Church.

IN pursuance of the promise made in one of our previous papers, we give below a list of several asylums, together with particulars of cost and numbers of patients accommodated therein, as well as the number of single rooms. It must be borne in mind that the

[1] By George H. Bibby, F. R. I. B. A., F. R. Hist. S., and Ernest A. E. Woodrow A. R. I. B. A. Continued from No. 936, page 113.

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provision of a large number of single rooms for the separation of patients adds greatly to the cost of an asylum building. The inmates are, of course, most economically housed, where arrangements for associating them in large dormitories exist, but a fair proportion of single rooms must always be allowed for, and, as a general rule, it will be found that patients in town asylums require more single-room accommodation than those who are located in asylums, situated in the country.

In this number we give a few examples of block plans of asylums, in Figures 1, 2, 3, 4, of Menstone Asylum, in Yorkshire, a design for Cheddleton Asylum, Staffordshire, Exeter Asylum, and Montrose Asylum. These types, together with those we have given in former chapters, are varieties of the forms of general arrangement, but at present such plans as those of Somerset, Claybury, Cheddleton, Sunderland and similar asylums appear to meet with most favor. Full references are given with these four diagrams, which explain the arrangements of the general plans.

An architect may obtain much knowledge by the examination of plans, but he will never have an accurate idea of the multifarious requirements of asylum planning until he extends his studies by visiting some of the best and some of the worst asylums themselves: if this be done in the company of some unprejudiced attendant, or other officer of the asylums, much might be learned by the architect, while no other method could teach him.

When the architect and the medical superintendent work in unison, as they did, we are given to understand, in designing the Whittingham Asylum, good results are achieved, which can be obtained in no other way.

The disputes and discussions that have been carried on for years among authorities and experts, as to the size an asylum should attain, points to the fact that seldom should an excess of one thousand patients be provided for in one institution. It is, however, still the practice to erect asylums of twice that capacity, and English architects have but lately been invited to prepare plans in competition for an asylum, to accommodate two thousand patients, and the Lancashire Asylum's board, who invite the competition, suggest the sum of £100 ($500) per patient as a reasonable price for the building. The cost would, therefore, be £200,000 or $1,000,000. This as compared with the outlay for recently-erected asylums, and with the published estimates of new schemes, seems, if modern improvements are to be incorporated in the design, far below the mark.

TABLE SHOWING COST OF ASYLUMS.

IRREGULARLY PLANNED ASYLUMS.

ASYLUMS.	AREA OF GROUND, ACRES.	NUMBER OF PATIENTS.	DATE OF ERECTION.	TOTAL COST.
Suffolk County	84	530	1827	
Wolton, Gloucester	200	780		
CORRIDOR ASYLUMS.				
Abergavenny	75	867 (159 single)	....	£98,000
Carmaerthen	47	560 (72 single)	1865	£80,000
Garlands, Carlisle	137	620		
Darby County	101	471 (115 single)	1851	£113,000
Sussex County	245	880 (165 single)	1859	£144,089
Weltshire County	90	715 (110 single)	1851	£83,000
London Co., Colney Hatch	½ mile long	2,250 269 males' s'gle... 289 females' s'gle.	1851	£26,000 original building.. £30,000 land. Greatly enlarged, total cost about £600,000...
Hereford	110	400 (77 single)	1872	£105,000†
Bedford Hertford Huntingdon		1,050	1860	
Essex County	120	1,350 { 555 males.... 795 females..	....	£79,497 original cost for 450 patients
Nottingham County	21 (in the town).	350 (112 single)		
Dorset County*	250	320	....	£50,000‡ further additions of female wards being built £60,000.
Buckingham County	52	450 (85 single)		
Cornwall County	59	706 (213 single)		
Kent County, Baring Heath	1,080	1,577 (327 single)	....	£220,000
Norfolk County		809 (147 single)		
Yorkshire, East Riding	100	310 (55 single)	....	£61,662‡
Berkshire County	164	500 (110 single)	....	£124,000‡
Northumberland County	100	550 (70 single)	....	£116,800
Worcester County	469	950 (now 1,061, 127 single)		
Middlesex County	142	1,100 (336 single)		£213 536
Surrey County, (Brookwood)	225	1,050 (110 single)	1867	£102,000§
Somerset County, (Wells)	107	830 (192 single)	....	£130,000 now being enlarged by Messrs. Giles & & Gough for 450 more patients, at a cost, £113,000...
Shropshire & Montgomery Co.		745		
Litchfield, (Burntwood)	147	630 (92 single)	....	£119,000§
Oxford County		476 (120 single)		
Leicester and Rutland County.	37	100	....	£18,000 since enlarged for 500 pati'ts.
Rainhill	232	1,800 (250 single)	....	£388,000†
Prestwich	193	2,300 (350 single)	....	£351,436‡
Yorkshire, West Riding		1,410 (179 single)	1818	
North Wales	100	539 (68 single)		
City of London	140	430 (70 single)	....	£100,000†
Ipswich	69	260 (44 single)	....	£32,000
Nottingham, Borough	30	560	1880	£60,000
Birmingham City	40	600 (94 single)		
—— Hill, Staffordshire	200	150[4]		
State Criminal, Brodmoor	323	630 { 480 males.. 150 females.. (400 single)..	1863	
Winford House	60	130	....	£71,000§
Warneford, Oxford	22	100	1826	
Coppice, Nottingham, private.	17	110 (40 single)	....	£30,000
Lincoln, lunatic hospital	7	80 (40 single)		
Barnwood House, Gloucester	240	160 (82 single)	1860	£77,000‡
Royal Albert, for idiots	105	600	....	£112,000†
Earlswood	200	630 (150 officers)		
Exeter City	90	340 (43 single)		

PAVILION ASYLUMS, WITH ONE-STORY CORRIDORS.

Asylum for Idiots, Dareuth[1]		1,000 children	....	£100,000
Second Gloucester Asylum[2 3]				
Leavesden[4]				
Caterham[4]		2,000 (46 single)		
Banstead[4]				
Surrey County[4]	151	2,000		

CORRIDOR PAVILION ASYLUMS.

This form of asylum construction is a combination of the two preceding forms, and when properly carried out, constitutes the best method of all, for an ordinary county asylum or hospital for the insane.

Illustration.—The corridors of communication should not be used as day-room space, though single rooms may very advantageously be arranged along one side of the corridor, and these corridors should be planned so as to form the readiest means of reaching the ward; otherwise there is some danger of another ward being made a thoroughfare, whatever the intention of the architect might have been: hence, either the main corridor of communication should be two stories high, or the staircase should be arranged so as to permit of the ward being reached without passing through any other ward.

Lancashire, Whittingham[5]		17,000		

This is without doubt one of the finest specimens of asylum architecture in England and its leading features show at once the close coöperation of a skilful architect and a medical superintendent.

Northampton County		880 (157 single)	1876	£115,000
Hull Borough		350 (80 single)	....	£51,000
Derby Borough		300 (96 single)	1889	

Asylums of this class have been erected in Scotland, Ceylon, Austria, Hungary, Belgium, Denmark, France, Germany, Norway, Russia, Turkestan and North and South America.

* Two buildings within one mile of each other.
† Includes land, building and furniture. § Building and furniture. ‡ Includes land.
[1] Straight corridors. [2] Broad arrow plan. [3] See *American Architect*, No. 933, page 71. [4] H plan. [5] Horse-shoe form.

NOTE.—The dates of the erection of the above asylums refer generally to the commencement of buildings which in many cases have since been repeatedly enlarged or improved.

The want of thoroughly good asylums (apart from county asylums for paupers), in which afflicted persons belonging to the middle classes may promptly receive the best treatment at a moderate charge, was met some thirty or forty years ago in England by the

The most suitable buildings for the cure and charge of the insane must, in the long run, become the cheapest to the rate-payers; but the excessive provision of costly items, which are neither needed nor appreciated by those for whom they would seem to be intended, is an unnecessary outlay.

Throughout the curable stage of their disease, insane paupers very frequently are retained in workhouses to save the expense of their maintenance in the county asylum. While so detained, they are receiving neither the right medical treatment nor the right supply of nourishment. Effectually to treat a pauper lunatic in a workhouse would, for want of the organized system and all the appliances belonging to an establishment built and maintained with the sole view to such a purpose, cost more than the charge payable to a county asylum for the care of him. Patients retained thus in the workhouse during the first weeks of lunacy are said not to show a fair percentage of recoveries, but, becoming worse, are sent, when the possibility of a perfect cure is at an end, to an asylum and become for the rest of their lives a permanent or occasional charge upon the rates.

We repeat, that an asylum architect must endeavor to learn all that he conveniently can respecting insanity and the habits of the insane. There are thousands among the ignorant who hold, concerning insanity, opinions little in advance of those of the day when Luther said, "Idiots "are men in whom devils have established "themselves, and all the "physicians who heal "those infirmities as if "they proceeded from "natural causes, are "ignorant blockheads "who know nothing "about the powers of "the demon. Eight "years ago, I myself saw "and touched a child of "this sort which had "no human parents, "but had proceeded "from the devil"!

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Society of Friends, who erected a "Retreat" near York. This institution long held a foremost place in the history of the amended treatment of the insane, and for its time, it was one of the best institutions in the land; not only was it self-supporting, but yielded a considerable surplus, devoted to the increase of its power to do good. The payments demanded were proportionate to the means of those who

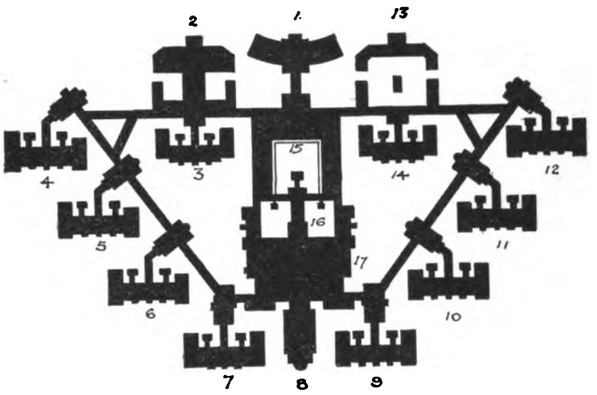


Fig. 2. Design for Cheddleton Asylum, by Larner Sugden, F. R. I. B. A. and A. Mosley, Architects.

1. Principal Entrance Block.
2. Laundry Block, Female.
3. Chronic Block, Female.
4. Chronic Block, Female.
5. Epileptic Block, Female.
6. Recent and Acute Block, Female.
7. Sick and Infirm Block, Female.
8. The Church.
9. Sick and Infirm Block, Male.
10. Recent and Acute Block, Male.
11. Epileptic Block, Male.
12. Chronic Block, Male.
13. Workshops.
14. Chronic Block, Male.
15. General Stores.
16. Kitchens.
17. Recreation and Dining Hall.

sought admission, and varies from six shillings a week to two pounds ($10): the appointments and diet were good, and patients were even provided with means of carriage exercise.

This example shows that self-supporting, good, and well-appointed, middle-class asylums are possible, and that it is not a necessity that heavy charges should be imposed upon the means of those whose misfortune it is that they have become as dead men in the midst of the families depending upon their efforts for support and livelihood.

The public should know that insanity in its first stages — and in its first stages only — is in very many cases curable, and that a sojourn for a few weeks in a well-managed asylum will do more at a less outlay, without any charge upon charity, than expensive visits to the seaside or costly sea voyages, or private treatment, and that the attention given in an asylum is the surest means of establishing a cure of the most afflicting disease to which man is liable.

We have endeavored in these few chapters upon this subject to draw the attention of the readers of the *American Architect* to the great importance that is placed by English architects upon the question of asylum planning, an importance which is daily increasing, for it is well known that this disease which causes such an enormous amount of misery, and deprives the world of a large number of its otherwise capable workers is ever increasing and descending from the afflicted parents to their offspring.

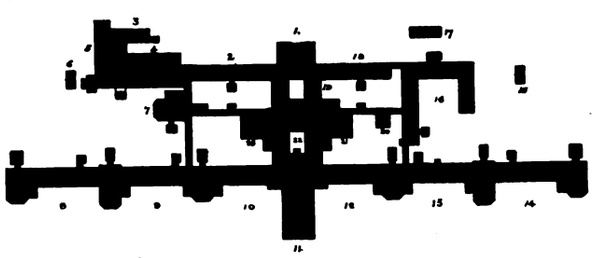


Fig. 3. Exeter Asylum. R. Stark Wilkinson, Architect.

1. Entrance Block.
2. Waiting-rooms and Attendants' Apartments.
3. Dynamo-shed.
4. Laundry.
5. Boiler-house, Pump-room, etc.
6. Mortuary.
7. Day-room, Laundry Ward.
8. Suicidal, Acute and Epileptic Female Ward, 70 Patients.
9. Ward for 40 Working Patients (Female).
10. Ward for 40 Dangerous Patients (Female) and on Second Floor.
11. Recreation-hall.
12. Ward for 40 Dangerous Patients (Male) and on Second Floor.
13. Ward for 40 Working Patients (Male).
14. Ward for Suicidal, Acute and Epileptic Male Ward.
15. Mortuary.
16. Workshops and Yard.
17. Coals.
18. Attendants.
19. Administrative Stores, etc.
20. Turkish-bath.
21. Dining-hall (Male).
22. Administrative Kitchens, etc.
23. Dining-hall (Female).

We have already referred to the fact that asylum planning, to a large extent in Great Britain, is in the hands of a few architects who have become specialists on the subject; it has been pointed out that if more open competitions were invited there would be a wider field of suggested improvements. This, however, is a question upon which we need not dwell here. It is true that of late years there have been more of these competitions than formerly, but the complaint has been that the conditions are so framed and the circumstances such as to greatly hamper the architect. To win a

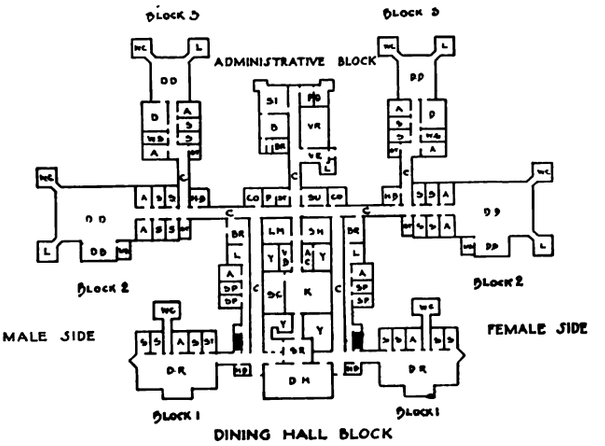


Fig. 4. Montrose Asylum.

Block 3, One Story in Height, for 10 Patients, contains: —

D D. Day-room Dormitory.
A. Attendants' Rooms.
S. Single Rooms.
D R. Dining and Day Room.
St. Store.
W S. Ward Scullery.
L. Lavatory and Bath-room.
W C. Water-closets.
H C. Housemaid's Closet.

Block 2 One Story in Height, for 18 Patients, contains: —

D B. Day-room Dormitory with Dining-bay.
A. Attendants' Rooms.
S. Single Rooms.
St. Store.
W S. Ward Scullery.
H B. Hats and Boots.
L. Lavatory and Bath-room.
W C. Water-closets.
H C. Housemaid's Closet.

Block 1, Two Stories in Height, for 22 Patients, contains: —

(*a*) On the Ground-floor.	(*b*) On the First-floor.
D R Day-room with Bay.	D R. Dormitory (14 Beds) with Bay.
A. Attendants' Rooms.	A. Attendant's Room.
S. Single Rooms.	S. Single Rooms.
Sp. Padded Rooms.	W C. Water-closets.
St. Store.	St. Store.
H B. Hats and Boots.	H C. Housemaid's Closet.
L. Lavatory.	L. Lavatory.
B R. Bath-room.	
W C. Water-closets.	
H C. Housemaid's Closet.	

competition for an asylum costing from £100,000 to £500,000 is to secure a financial prize in the professional lottery.

[The end.]

DEIR EL BAHARI.

BUILT for the worship of a dead man, like all the great fanes on the left bank of the Nile at Thebes, the temple at Deir el Bahari has no progressive national character. Successive dynasties have not altered or enlarged it; it remains an expression of a single period, the zenith of Egyptian greatness. Its history as a building is comprised in the additions that the Queen herself made to her own plan, and the mutilation of her names and titles by order of her vengeful nephew; the heretic Amenophis hacked out here, as everywhere, the figures and names of Amen-Ra; here, as everywhere, the inevitable Rameses II restored them in a style, unworthy of the first hand. In neglectful times the mountain was allowed to slip and break-in roofs and fill-up courts. A Coptic convent, built over part of the highest terrace, added its rubbish to the mounds formed already over the lower levels. Hardly a third of the whole temple was visible two years ago, and the rest seemed doomed to lie forever under forty feet of earth and stones.

The Egypt Exploration Fund, however, came to the rescue in the early part of last year, and with 200 men and a Decauville tramway succeeded in clearing the greater part of the highest terrace before the hot season began. The finds made in the process were as remarkable as unexpected. The buried north end, instead of being symmetrical with the south, as Mariette had supposed, upheld the general character of Egyptian buildings by being utterly unsymmetrical and abnormal. To balance the small "chambers of offerings" on the south there was found on the north a large hall, in the inner part of which rose a high altar dedicated to Harmachis by the Queen. The displaced stones have been built-in again now, and the great platform of brilliant white limestone, with its frieze of hieroglyphics and its graduated ascent, stands almost as complete as it ever did, the only such altar extant in all Egypt. Beside it a little funerary chapel runs into the rock, its walls a marvel of brilliant coloring. During the present season operations have been carried on with a larger staff, including two artists to reproduce the sculptures for publication. Two hundred and fifty men have been set to work on the great mounds under which the northern half of the central terrace was buried, and bit by bit they are being carried away in the Decauville cars to a deep pit a quarter of a mile away. Pillar by pillar the graceful colonnade which ran round the north side and northwest corner of the terrace is emerging from the earth. Until

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this year not one person in a hundred who visited Deir el Bahari knew that it existed, and still fewer suspected that it ended in one of the finest painted halls in Egypt, soon to be opened to light and air.

It is always interesting to watch an excavation in Egypt at any stage of its progress, for so many treasures of so many kinds lie everywhere in the preserving sands. Here at Deir el Bahari the diggers, drawn from Theban villages, have been tomb-robbers to a man and have lynx eyes for small antiquities. Pecking away at the lower layers of the mounds, they let hardly a minute pass without picking up scarabs, amulets, beads, or bits of that wonderful blue-glazed ware which ranks among the finest products of the ancient world. Here a fragment of potsherd, inscribed with Coptic writing, slides down the earth slope; there rolls a limestone chip, covered with Demotic characters. These are the archives and, it seems, also the library catalogue of the monastery built here in the early days of Christianity. Now and then a refuse heap is reached, and bits of papyrus, Greek, Demotic and Coptic, are taken out in handfuls, together with broken objects of every sort and kind, and many precious fragments of sculptured walls.— *London Times.*

THE PROPOSED DESTRUCTION OF PHILÆ.

IN a recent copy of the *Manchester Guardian* may be found the following remarks by Mr. W. St. Chad Boscawen concerning the fate of Philæ: —

The decree has gone forth that Philæ, "the pearl of Egypt," "the ever-praised, but never sufficiently praised" island, shall disappear. In sober fact, the commission appointed to report upon the best site for the vast reservoir which is to store the life-giving waters of the Nile and make a garden of Upper Egypt, as the Barrage has of Lower Egypt, has reported in favor of the dam being made at the island of Shellel, a few yards above the first cataract. By this means the level of the river will be raised to a height of several metres, and at high Nile the vast superfluity of water run into a reservoir which will fill the "summer canals" of Upper Egypt and enable cultivation to be carried on during the summer as well as in the winter and spring. Whatever may be the capable output of this water store, and it will require some three to four thousand million cubits of water per annum, the rise in the river will be of such a character as to flood to a considerable depth the beautiful island of Philæ and its temples. This may in some degree be modified, as Colonel Ross, R. E., has suggested, by making the rise more gradual, but this remains to be seen. Still, as the project now stands, the order is "Perish Philæ." To the traveller who has toiled up the Nile, especially if "personally conducted," wearied with the endless panorama of half-inspected temples and tombs, and his ears ringing with the drone of the parrot-like dragoman, Philæ is a paradise. To the ancient Egyptians of centuries ago, it must also have been the same; hence its name, Pa-alek, "the end, the termination," for it was the end of the pilgrim's voyage who had come from the north to visit the sacred home of Isis. It was the end in another sense, for it was here that Egypt proper ended, and beyond was the dark continent; so, hither came the armies bound south to fight against the Ethiopians, to sacrifice for fortune. Those who have seen this island of temples can well understand how the ancient Egyptians made it the home of the lovely Isis. It is, without doubt, the most beautiful spot in the Nile journey. Here, the blue rainless sky, the rippling river rushing on to the torrent of the cataracts, the waving palms and rich verdure combine with the stately ruins to form a picture which has inspired the brush of many famous artists. The Egyptians, ever sensible to the beauties of nature, placed here the grave of Osiris and the temple of the weeping Isis. From the earliest times, certainly those of the twelfth dynasty, the island was a place of pilgrimage, but it was not until later times, until the period of the revived empire under Nectanebo II (B. C. 287), the contemporary of the Persians, that the great Temple of Isis was built.

The buildings of Nectanebo are not very extensive, but are of great interest to archæologists. The small hypostyle vestibule at the south end of the island, near the pilgrims' landing-stage, is curious on account of its assumed ancient style. Outside of this pavilion formerly stood two sandstone obelisks, one of which was removed by Belzoni and is now in the garden of Kingston Hall, Dorset. In addition to the inscription of Nectanebo, it bears a petition to Ptolemy Euergetes II from the priests, complaining of the too frequent royal visits and the expense they entailed on the poor temple revenues. It is, however, to the Ptolemaic dynasty that Philæ owes most of its beautiful buildings. The most important of these are the Temple of Isis and the fine pylons leading to it. This temple was built by Ptolemy VII, Philometor, B. C. 181, but there are many later, down to the time of Tiberius, A. D. 14. This temple is called the "birth-house" (Meshen), and similar chambers are found at Edfu and Denderah. This is by far the most interesting portion of the temple. Here we see all the scenes connected with the birth and nursing of Horus. In one scene we have the infant child Horus born in the presence of the great gods, Amen and Thoth, descending from the lotus flower. In another we see a goddess, probably Isis, nursing the child, while Hathor, the patroness of birth and fairy godmother of the Egyptian pantheon, is patting her hand affectionately on the child's head. The presence in the groups of Ptolemy IX, who stands beside Hathor, and of his sister and wife, Cleopatra I, shows that we have here really, blended with the old Horus myth of Egypt, the according of divine protection to the new-born Pharaoh. Not only have these sculptures preserved a Ptolemaic myth, but they have furnished the basis of a curious modern Arab legend: the curious story of Anas-el-Wogud, the beautiful youth who pursues the beautiful, but ever-fleeing, maiden, Zahr-el-Ward, "the Flower of the Rose," is located at Philæ. Like Osiris, he comes to the island on the back of a crocodile; here the mummy of Osiris is represented carried on the back of a crocodile. Here the lady escapes from her prison, where her father had hidden her, by a rope made of her clothes. Eventually they meet, and are married with the paternal blessing, and, as the Arab writer poetically put it, "So they lived in the bosom of happiness to an advanced age, in which the roses of enjoyment shed their leaves, and tender friendship must take the place of passion." According to Arab tradition, the birth-house already described was their bridal chamber. Surely it will be a pity to lose so interesting a chamber, the centre of so many poetic legends.

It is impossible in the limits of a single article to describe the many points of interest in this great temple. One other room, however, must be described. This is the small cella and vestibule on the west of the Hypostyle hall. Here we have Horus receiving the waters of life from Isis and Nephthys after his birth, and Thoth writes his name on a palm leaf. But of more interest is a sculpture which may be called a very early example of landscape, a scene representing the rising Nile. There we see one of the cataract islands, with its rocky cliffs, with a cave in its lower part. In this is the figure of the Nile god holding two vases in his hand and guarded by a coiling serpent. From the vases flow the two streams of the river. Above, are the vulture of Muth and the hawk of Horus keeping guard, and below, the inscription "The very distant and very sacred who rises in Senem." There is one other building in this beautiful island which we shall miss with regret. It is the beautiful little kiosque known as "Pharaoh's bed." This beautiful open pavilion chapel of Hathor is known to all who have visited the island. It is a work of very late date, being of the time of Nerva Trajanus. Here, in evidence of Greek art, we see, as Ebors remarks, as it were "a line of Homer among the hieroglyphic inscriptions." The kiosque is perhaps the best known part of Philæ, painted by thousands of artists, visited by thousands of tourists, the scene of many a merry luncheon-party. It will, indeed, be missed with deep regret when submerged beneath the waters of the Nile. The order "Exit Philæ" will no doubt cause much regret and some indignation among archæologists and artists who knew Egypt: but let them remember what the work to be undertaken means. It means new life to Upper Egypt, it means the conversion of thousands of acres of desert land into a garden, it means Egypt freeing herself from the mountain of debt which has crushed out all her life. If it is to be as the commissioners decide, let us rescue all we can of this beautiful temple. Some suggestion has been made of rebuilding the ruins elsewhere. This is on the face of it absurd. Certain chambers, such as those mentioned in this article, might be removed, and the "Pharaoh's bed" also. What should be done is that a thorough exploration of the site should be made, and casts taken of all that is worth keeping, and then we must bow the head as the sacred river closes its waters over the home of Isis, and once for all "exit Philæ."

BOOKS AND PAPERS.

HAS the reader ever visited Venice and in his wanderings about that labyrinthine city stopped constantly before the little shops filled to overflowing with countless useful and decorative household articles, made out of thin and narrow iron ribbon? They are to-day one of the most characteristic sights of Venice, and their product is so great that it must represent no inconsiderable factor in the fiscal returns of the city's domestic commerce. Wonderfully graceful and ingenious are some of the forms that are produced in this pliable material, and it is a sore trial to resist the temptation to buy all sorts and kinds of things made of it, for one is ready enough to risk the chance that the article may be squashed out of shape through faulty packing before it reaches this country. All ages of persons, of both sexes, are occupied in this work, though, generally speaking, it seems to be left mainly to the hands of women and young persons, for the labor is light and all that the work requires is an easily-acquired manual dexterity coupled with an active imagination and sense of form.

It is a kind of work that may be practised anywhere, and causes so little noise that as a house occupation for amateurs it is unobjectionable, and Mr. Leland, in describing this process and stating the simple instructions needed for its successful accomplishment, has brought within reach of amateurs and others one more art-industry which can afford occupation and amusement for the idler who objects to wholly waste his or her time, though there are objections to undertaking a more time-consuming pursuit.

Working in metal ribbon is comparatively noiseless, but noiselessness is anything but characteristic of the other classes of working in metal which Mr. Leland describes; for flat sheet-metal can hardly be worked without the nerve-racking noise of the fret-saw and file, unless indeed the worker abandons all thought of open-work, and brings

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the design into being through embossing the metal; but the rat-tat-tat of the embossing hammer and die is hardly more peaceful than the gnawing of the file.

Anyone who has a fancy to undertake art-work in metal, which in fairly satisfactory form is not difficult to produce, will find this handbook [1] of much use.

WHAT is there in the study and practice of the fine arts [2], which is so at variance with the literary instinct, that while floods of literature of all sorts, and of all degrees of merit and interest, are poured forth year after year upon a patient world, from men and women of all other callings and of no calling, it is a rare exception, when any book is produced by one who follows art, and the rarest of exceptions when one is so produced which has anything to say which it is good to hear? Is it, perhaps, that the work of an artist lies in the region rather of feeling than of thought, and that his only effective mode of expression is that which addresses the eye or the ear — that to him "the form alone is eloquent," and that language is either too poor or too much outside his daily habit to seem to him a natural or efficient medium of communication with the outside world?

Whatever the reason may be, the fact seems to us not less interesting and curious than it is certain, that the artists are, as a class, deprived of the literary faculty, and that the literature of art, which is, Heaven knows, sufficiently plentiful, is the work of students who are not professors.

Perhaps, of all artists, architects are the most silent. One can count on the fingers — we were about to say — of a single hand, the members of that profession who have, in our day at least, written books in any department of architecture which have any substantial value. The engrossing character of an architect's work does not explain the fact. Men of other professions not less engrossing — of law, of medicine, of science — are habitual writers in their own special fields, and broaden by their writings the general interest as well as the professional knowledge therein. In our own country the silence of the architects is the more remarkable, from the lively interest which the most intelligent readers do undoubtedly take in architectural subjects. We complain, and not without reason, of the lack of intelligent appreciation of good architecture among our people; but we do not, perhaps, sufficiently realize that the architects themselves are in no small degree responsible for it. The people, so far as they are yet of Anglo Saxon blood, are by nature and race more or less insensible to art, in any form, but they are ready to be taught, and to some extent their general intelligence can be relied upon to make good the defects of their inherited instincts.

This is a long preamble to what we have to say of Mr. Van Brunt's book, which we welcome gladly, not alone on purely personal grounds, but because the writer is an example of an architect who, from his youth up, and in the midst of steady and conscientious professional labor, has felt the impulse to speak out from time to time on those topics which exercise the thoughts of intelligent and active-minded men of his calling, and to bring the thinking portion of the reading public, to some extent, within the circle of professional thought.

We hardly dare say how long a time it is since the essay on Greek Lines first appeared in the early pages of the *Atlantic Monthly*, where it drew immediate attention by the unusual character of its subject, by the grace and charm of its style, and by a certain poetic temper with which the writer had contrived to soften the austerity of so abstract a topic. In this poetic temper, indeed, lies a danger which Mr. Van Brunt has not altogether escaped — the danger of attributing to a work of art more qualities than rightly belong to it, and to its designer sentiments and principles, which may or may not have been part of his character, but which were assuredly not essential to his capacity for the work he produced, and which are in sober truth not expressed nor indicated by it. To ascribe to an abstract line such qualities as love, chastity, tenderness, religious reverence — or to say that the design of the Greek architect "was studied seriously, in the midst of a deep silence, like a religion," or that the typical line of the Byzantine Greek was one of robust and vigorous life, "*because* of the final safe establishment of Christianity after the persecutions of Diocletian," is to load both art and artist with a greater responsibility and significance than can rightly be put upon either. It is wiser and safer, as it seems to us, to keep a little nearer the ground, and to content ourselves with admiring and justly appreciating the strictly intellectual and artistic supremacy of the Greeks. Here we are in no danger of excess. Mr. Van Brunt expresses well this feeling, where he speaks of the "characteristics of nervous grace and severe intellectual restraint, which are found wherever the Greek put his hand and his heart to work. Every moulding bears an impress of refinement. . . . The antiquities of Attica afford nothing frivolous, no playful extravagances or wanton meanderings of line, nor did they ever submit to the tyranny of conventional formulas; but ever loyal to the purity of a high ideal, they give us, even in their ruins, a wonderful and very evident unity of expression, pervading and governing every possible mood and manner of thought," and a little further on, where he enlarges on the wise reserve and self restraint of the Greek and the selection and use of the materials for ornament.

The papers on "Conscience in Architecture," on "The Personal Equation," and on "The Present State of Architecture" are logical continuations of the same train of thought which characterizes the first paper. With a somewhat soberer and less exuberant style, as is only natural in the work of maturer years, they are all marked by the same serious and earnest conviction of the duty and privilege of the architect, to stand fast by the solid and immutable principles of his art — to resist the impulse of passing enthusiasm, or the fashion of a day, under which we have more than once seen the whole profession stampeded by a distinguished success on the part of a single man — to hold under stern restraint the temptation to profuseness and excess which is engendered in our day by the enormous accumulation of architectural precedents, and "above all, to content ourselves with simplicity and purity, and refrain from affectations."

We have no time or space to do more than refer to the many admirable passages in these essays, as for example, the excellent account of the revival in Germany, under Schinkel, and in France under Labrouste and others,— the account of the rise of the modern profession of architecture with the Renaissance, the supremacy of the Italians in the surprising period of activity which followed. The papers are full of instruction and stimulas for the architect, and scarcely less so for the general reader, and we trust we may hope for more from the same source.

WILLIAM HENRY BISHOP, the novelist, makes a plea for the simple and homely buildings such as contented our forefathers, and it is pleasant to read his words in the midst of the prevailing craze for odd and bizarre styles of architecture. In the May number of the *Century*, describing his search for a summer home in Massachusetts, he says:

"Two small, white meeting-houses show their Christopher Wren steeples complacently. Time has been when all these white, country meeting-houses alike seemed to freeze the imagination with their coldness; but times change, and we with them. The charming grace and lightness of design that many of them possess have been recognized; their whiteness is a refreshing spot amid the greenery: in short, they are coming back into favor again, with the many other nice old-fashioned things of the period, and the invasion of Gothic chapels that succeeded them had better look well to the security of its domination."

ILLUSTRATIONS

[Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.]

THE METROPOLITAN CLUB-HOUSE, 59TH STREET AND FIFTH AVENUE, NEW YORK, N. Y. MESSRS. McKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print issued with the International and Imperial Editions only.]

COMPETITIVE SCHEME FOR PROPOSED BUILDING FOR AMERICAN SURETY COMPANY, NEW YORK, N. Y. SUBMITTED BY MR. GEORGE MARTIN HUSS, ARCHITECT, NEW YORK, N. Y.

THE style of the scheme herewith submitted was chosen in consideration of the generally admitted architectural preëminence of the Belgian civil and municipal buildings, which surpass those of any other country. . . .

Although having twenty stories and an attic, besides the basement and cellar, such care has been used in proportioning the masses that the effect of a much less-storied structure is obtained, while the picturesque and varied sky-line solves one of the most difficult problems presented. The roof, with its lantern or lookout, some 330 feet above the pavement, would be a superior station of observation for the United States Signal Service, while the space immediately below (where not utilized for storage tanks, janitor's quarters, etc.) would give abundant room for all the necessary machinery, instruments of precision and the like, required for this important branch of the service.

The Belgian Renaissance or Hanseatic style of Architecture is peculiarly well adapted to the rigid requirements of an office-building, because such buildings must be nearly all windows and the reposeful wall-surfaces must be at a minimum. An effort has been made to obtain a novel effect by recessing the main dormer gables, thus accenting the corner pinnacles, and so giving a decisive and bold aspect not heretofore generally obtained. An existing example of this recession is seen in the new Manhattan Life Insurance Company's building. . . .

Typical Floor Plan: — There are twenty-four (24) offices, and the axis of the court being about north and south, the best light possible is obtained for these rooms — while the larger space in front of the elevators, entirely distinct and apart from the hall and lighted from the south, gives a fine impression of each floor by its generous proportions and appeals most powerfully to intending tenants. In so many buildings the elevator-landing is made a part of the common passageway, that it is hoped the effort here made to obviate this disagreeable feature will be appreciated.

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[1] "*Elementary Metal Work.*" A practical manual for amateurs and for use in schools. By Charles Godfrey Leland. New York: Macmillan & Co., 1894. Price $1.75.

[2] "*Greek Lines*" and other Architectural Essays. By Henry Van Brunt, Boston: Houghton, Mifflin & Co., 1893.

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Office Unit: — One of the main features of this scheme is the division of the rentable space into nearly equal units. The unit adopted is about nine feet by sixteen feet, making it possible for professional men or others, desiring small space or a number of small rooms, to obtain the same without paying for any more square feet than they actually need. This availability of all the floor-space insures the maximum rent per square foot.

Alternative Floor Plan: — On the alternative plan herewith presented the first floor shows an entrance foyer which leads to the elevator space, beyond which are the stairs made of iron and glass.

Two banking-rooms on the first floor, one quite large and one medium, utilize all the available space, and through the generous windows and skylight receive the best possible light. Instead of the ordinary marble treads, heavy wire-glass is proposed for the staircase, thus capturing all the stray light obtainable. The marble or onyx fountain with the surrounding seats is designed to be an artistic attraction.

Splendid accommodations for the two Corporations, as also for the three floors devoted to the use of the American Surety Company, are obtained. . . .

Foundations: — The question of foundations is one which cannot at the present time be definitely decided, a more thorough investigation of the site and nature of the strata being necessary.

There are three usual methods of founding on such buildings. First: resting directly upon the natural soil, spreading the footings to limit the pressure to that suitable for the particular earth. Second: the driving of piles either to a hard substratum, or sufficiently to consolidate the bearing earth. Third: the sinking of caissons, or wells, through the earth to the rock. As far as present information goes, it is thought that the second and third methods will be found unnecessary, as the expense of either of these is so great as not to warrant its adoption unless it proved impracticable to use the first method. It is found from the borings, made by the Rapid Transit Commission, at the corner of Broadway and Pine Street, that the subsoil is entirely of sand varying in degrees of fineness to a distance of about seventy feet below the curb, where bed-rock is found, and it is believed that the expense of reaching rock at this distance below the surface will be unwarranted. Neighboring structures of considerable magnitude are founded upon this sand with satisfactory results. The spire of Trinity Church, which is neary 300 feet high, rests upon this bed, exerting a pressure of about 3½ tons per square foot. The Queen Insurance Company's building (now Metropolitan Trust Company), in Wall Street, is founded upon the same soil with a pressure of 3¼ tons per square foot. The Mutual Life Insurance building on Nassau Street, also the new addition on Liberty Street, is on the same bed of sand and exerts a pressure of 3½ tons per square foot. The new building for the Continental Insurance Company on Cedar Street is similarly founded, with a pressure of about 4 tons per square foot. Numerous other buildings in the immediate neighborhood might be mentioned with similar foundation loads. In view of these precedents, it is believed that it will be entirely practicable to support the building upon the sand, spreading the footings by steel grillage, thus avoiding the usual heavy brick foundations and loss of cellar-space, so valuable for safe-deposit vaults, etc.

The total weight of the building will be twenty-two thousand (22,000) tons, and the area of footings six thousand three hundred and twenty-six (6,326) square feet, giving a calculated earth-pressure of 3½ tons per square foot.

With this type of foundation there can be obtained sufficient head-room for basement and cellar without going below the foundations of the Schermerhorn Building, avoiding the risk and expense attendant upon underpinning this building. . . .

Heat, Light and Power Plant, and Ventilation: — Referring to the internal functions of the building, particular attention is drawn to the compact, yet wholly sufficient and complete, detail of boilers and machinery shown on the basement plans, which are in reality in the cellar. All of these are comprised in the space indicated, and by the omission of the basement floor of this portion only, an ideal engine-room is obtained.

The requirements of a building of this character in the way of heat, light and power, are amply provided for by the general arrangement shown in this scheme. Ventilation forms an important feature. In many of the office buildings which have been visited, there are provided numerous blowers, intended to supply fresh air to banking-rooms and offices. Often these blowers are not in active operation. Upon inquiry as to the cause of such an appliance not being in use, it has been invariably said, by the parties in charge, that the building can be *heated* without the use of the blower. That these blowers were provided, not for heating, but for supplying fresh air, is a fact that seems to be entirely ignored.

A portion of this building, of inferior rental value, has been selected for a ventilating flue, by the use of which it is feasible to obviate both the expense and necessity of blowers. In this ventilating flue is created a ventilating action which cannot be abandoned by the engineer, because in the very effort to produce power and heat, the required ventilation will necessarily be produced.

After deducting the space occupied by pipes, smoke-flue and elevator machinery, this ventilating flue contains nearly 50 square feet of clear area. Its height is something over three hundred (300) feet. It will be heated throughout its entire height by the boiler-flue and exhaust-pipe, creating an upward air current of, at least, 850 lineal feet per minute, equivalent to the power produced by a 25 horse-power engine and blower. This flue alone is capable of discharging every thirty minutes, a volume of air equal to the entire cubical contents of the building. Its close proximity to the boiler-room, engine-room, banking-rooms and offices, makes it available, no matter what the division of the rooms may be. The strong draught produced by this flue completely obviates any possibility of heat penetrating beyond the walls of the ventilating shaft, and tends to *cool* the surrounding halls, at the same time acting as a powerful ventilator for the toilets, as before mentioned.

This flue also serves as a receptacle for the elevator cylinders, as well as all of the heating and plumbing pipes necessary for the immediate service of the building.

A grating is provided at each floor-level, sufficiently strong to furnish a stable platform, and will be constructed so as not to retard the velocity of the upward air-currents. This space may also be lighted by electricity. A door will be provided at each floor, to give access for repairing pipes or machinery. Borrowed light, both from the elevator-shafts and from the adjoining corridors, is secured as indicated on the drawings. . . .

Tables: — Appended herewith are tables showing, first: the rentable area of each floor after deducting the amount of space devoted to walls, stairs, elevators, halls, etc.; together with a calculation of rents which may be obtained, based on prices charged for similar accommodations in the neighborhood. This is certainly a very conservative estimate, as the superiority of this proposed building over adjoining buildings will render probable a return even larger. Another table contains an estimate of cost of the building; and finally a statement is made of the cost of operation, and maintenance of the building, and the net return based upon the assumed value of the property, as stated in the daily papers.

TABLE I.

COST OF BUILDING. — OLD BUILDINGS ASSUMED TO BE REMOVED FOR VALUE OF MATERIALS.

Excavating, sheet-piling and sidewalk covering		$3,826
Masonwork		137,101
Ironwork, (structural and ornamental, including stairs, etc.)		199,196
Carpenter work		117,280
Plastering, (including partitions)		39,700
Painting		5,000
Heating and ventilation		68,000
Electric-lighting		39,100
Plumbing and gas-fitting		65,000
Elevators		58,500
Tiling, marble work and wainscoting		128,250
Two fronts (stone in 5 lower stories, remainder brick and terra cotta)		101,500
Mail-chute		2,000
Clock and illuminations		2,100
Total contract cost of building		$966,553
Assumed cost of gas and electric fixtures	$10,000	
Architect's fee 5%	48,827	58,827
Total investment ready for rental		1,025,380
NOTE. — Extra cost if entire fronts are of stone		78,500

TABLE II.

RENTABLE AREAS AND ESTIMATED RENTALS.

Floor.	Number of rentable square feet.	Estimated rents.
Basement and cellar	13,506	$15,000
First floor	4,548	30,000
Second floor	4,299	20,000
Third floor	4,512	18,000
Fourth floor	4,626	16,000
Fifth floor	4,413	11,000
Sixth to twentieth floors	4,049	150,000
		$260,000

TABLE III.

RUNNING EXPENSES AND NET RETURN.

		Per Annum.
1 Janitor and chief engineer		$5,000
Engineer department.		
1 Assistant engineer	$1,200	
1 Electrician	1,000	
1 Licensed night-engineer	960	
1 Fireman	720	
1 General utility man	600	
7 Elevator conductors	3,780	
1 Elevator starter	600	
		8,860
Janitor department.		
1 Night watchman	720	
1 Head porter	600	
5 Day porters	2,400	
1 Night porter	480	
15 Floor women	2,880	
6 Hall or scrub women	1,152	
3 General utility women	576	
		8,808
Total service		$22,668
Depreciation of machinery and general repairs to machinery and building	6,000	
Engineers' and janitor's supplies	1,050	
Coal for all purposes	7,500	
Water for boilers	300	
Water for house purposes	900	
Removing ashes	192	
Gas and Electricity from street	900	
Renewing electric-lamps	1,620	
		18,462
Miscellaneous		1,000
Total running expenses		42,130
Taxes, valuation 1½ millions real-estate	30,000	
Insurance	900	
Loss of rental and vacancies	9,100	
		40,000
		$82,130

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Rentals as per Table II	$260,000	
Operating expenses	82,130	
Net return	$177,870	
Investment in Building	1,025,380	
Value of land as reported in papers	1,450,000	
Total investment	$2,475,380	
Percentage of net return to total investment	$\frac{177,870}{2,475,380} = 7.18\%$	

COMPETITIVE DESIGN FOR THE SURETY BUILDING, NEW YORK, N. Y. MR. J. R. THOMAS, ARCHITECT, NEW YORK, N. Y.

FRAGMENT OF A VENETIAN FACADE. SKETCHED BY MISS K. M. HUGER, NEW YORK, N. Y.

THIS drawing was hung at the late exhibition of the Architectural League.

THE TARRANT BUILDING, NEW YORK, N. Y. MR. HENRY R. MARSHALL, ARCHITECT, NEW YORK, N. Y.

THIS drawing, too, was shown at the same exhibition.

[Additional Illustrations in the International Edition.]

INTERIOR OF THE GALLERY OF FINE ARTS, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. CHARLES B. ATWOOD, ARCHITECT.

[Gelatine Print.]

ENTRANCE GATEWAY TO THE METROPOLITAN CLUB-HOUSE, 59TH STREET AND FIFTH AVENUE, NEW YORK, N. Y. MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print.]

MENTMORE, BEDFORDSHIRE, ENG.: FROM THE GARDENS. MR. H. STOKES, ARCHITECT.

LORDSHIP LANE HALL, LONDON, S. E., ENG. MR. H. G. BRACE, ARCHITECT.

THIS hall provides seating accommodation for about 370 people, and has cost 3,500*l*. By means of colors, effect has been gained which cannot be suggested in the drawing. Luton bricks with red dressings have been used for the dado, malms above bays only being finished in plaster-work. The object of the two levels for the floor was to fit the hall for use for private purposes, the top floor being for refreshments and a lounge, the lower for dancing, and in this it has been found particularly successful, as also that the finish gives a warm and furnished appearance, without special decoration.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

A JUSTIFIABLE CRITICISM.

RICHMOND, VA., April 23, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — For quite a number of years I have been a regular subscriber to your valuable weekly publication, and have consequently quite a collection of text and selected plates in my office which I frequently refer to and compare one with the other.

Your last number of April 21, 1894, contains among its illustrations, the floor-plans of an odd-shaped country house, with a perspective sketch of same below them. It struck me, as being very similar to a design I had but recently seen, and on referring to your issue of September 9, 1893, I found a design of "Mamakating Inn" for the Sullivan Co. Club, of New York, by a well-known firm of New York architects, the two ends of which being covered, will leave the central portion identical even to the accessory details of roadway, rocks, foliage, and almost, even the blades of grass, with that published in your last issue. The names of different architects appear on both drawings, and the names and the initials of the draughtsmen who executed them are not the same.

An article in your next issue will be, doubtless, looked for in answer to many questions that will be asked, as to the possibility of two such similar designs and drawings having been conceived and executed by altogether different persons.

Some years ago an ambitious young architect in Washington, D. C., published a book of architectural designs for private circulation, which were copyrighted as original with him. This publication came under your notice, and the striking similarity of one of the designs, as published, to one that had previously appeared as coming from well-known architects of established standing, provoked some criticisms that were, I believe, generally approved by the profession.

If the curious phenomena in the case to which your attention is now called can be scientifically explained, I believe there are many like myself who will read such an explanation with no little interest and gratification. Yours truly, AN OBSERVER.

[HAD we noticed the points our correspondent points out the second design would never have been published, in this journal at least — to the injury of the designers of the original building, Messrs. Delhi & Chamberlin. — EDS. AMERICAN ARCHITECT.]

ATTEMPTED EVASION OF PAYMENT FOR SERVICE RECEIVED.

April 20, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Will you kindly tell me where I can cite cases decided, and what cases, in regard to the following: I make plans, details, specifications, and get bids on a building. Submit same to owners. They are returned to me, saying they are not wanted. But before sending them back to me, the owners gave them to another architect (who agrees to build structure for 3½% commission, we charging 5%) who completes building on same lot according to our plans, adds two more stories and changes façade; we, however, had contemplated two additional stories in sketches.

Present conditions are: They, the owners, acknowledge having used our plans, but refuse to pay commission, saying we had no right to the ideas in those plans, not having had them patented. The plans were complicated and original, and do they not practically make themselves liable, and actually accept the plans by having used them. An early reply by letter, or through the *American Architect*, will confer a great favor on, Yours with esteem,

VITRUVIUS.

[VITRUVIUS seems, from his story, to have an excellent case. A person who asks an architect to make drawings and specifications for him, or who takes the benefit of them when they are made, can no more escape paying for them than he could avoid payment for a barrel of flour that he and his family had consumed; and the pretence that, after the designs have been made for him, he is entitled to use them without payment, because they are not patented, is too ridiculous to be serious. So far as we can see, there is no point of law involved, so that references are hardly needed; the whole matter is one for the jury. If the jury, on hearing all the evidence, decides that the architect was employed to make the drawings and specifications, or, supposing him to have volunteered to do so, that the client availed himself of them, it will assuredly award the architect reasonable compensation. How much is reasonable compensation will be for the jury to say, but there is not much doubt that in Chicago, a sum would be awarded approximating pretty closely to the ordinary professional charge. The cases of Nourry *vs.* Lord, 3 N. Y. 392; Walsh *vs.* St. Louis Exp. 16 Mo. App. 502, 90 Mo. 459; Tilley *vs.* Cook Co. 13 Otto, 155, seem to be most analogous to this, but any case where service was rendered or accepted would apply. — EDS. AMERICAN ARCHITECT.]

COMPARATIVE COST OF ORDINARY AND FIREPROOF CITY HOUSES.

NEW YORK, N. Y., April 25, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In making drawings recently for three four-story American basement city houses on lot 50′ x 100′, I decided to procure estimates for both the ordinary and fireproof construction. The result is at once satisfactory and interesting and is as follows:

Ordinary brick construction, with wooden beams, etc., $19,980.
Fireproof construction, with steel beams, $20,615.

The estimates were submitted by reliable firms and a difference of only $635 on three houses makes the two methods practically the same in cost. The advantages gained by fireproof construction are manifold; especially the economizing of space in width, which is an important item when land is expensive. I found, however, that this result could only be obtained by a particular kind of steel construction and have made full drawings of both methods to prove same. If above is a fact, there appears to be no longer any reason for building non-fireproof city houses. Thinking this will interest you, I remain, Yours truly, MANLY N. CUTTER.

EXHIBITIONS

BOSTON, MASS. — *Several hundred Specimens of Textile Designs of all countries, from the second century to the present time, from the collection given by Denman W. Ross; also a collection of Japanese Color-prints:* at the Museum of Fine Arts.

Water-colors by S. P. Rolt Triscott: at Chase's Gallery, 7 Hamilton Place, opens April 20.

Water-colors of Bermuda by C. Scott White: at Gallery of Foster Brothers, 164 Boylston Street, April 18 to May 5.

CHICAGO, ILL. — *Annual Exhibition of Water-colors:* at the Art Institute, April 3 to May 6.

Exhibition of Architectural Drawings: at the Art Institute.

Drawings and Etchings by Joseph Pennell: at the Art Institute, April 17 to May 7.

NEW YORK, N. Y. — *Sixty-ninth Annual Exhibition, National Academy of Design:* 23d Street and Fourth Avenue, April 2 to May 12.

Annual Exhibition of Competitive Drawings by Students of the Academy: at the National Academy of Design, 23d Street, corner Fourth Avenue, May 10 and 11.

ST. LOUIS, MO. — *Exhibition of Architectural Drawings by St. Louis Chapter, A. I. A.:* at the Museum of Fine Arts, April 27 to May 13.

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NOTES AND CLIPPINGS

SIGNALS BY GROUND CURRENTS. — In a paper read before the Society of Arts lately, Mr. W. H. Preece, F. R. S., considered the subject of sending signals by means of electricity from one place to another without the intervention of any conductor, unless the all-pervading ether be termed a conductor. In 1884 it was noticed that messages sent through insulated wires buried underground in the Gray's Inn Road were read upon telephone circuits carried on the tops of houses eighty feet away. In 1885 it was found that currents passing in a telegraph line between Durham and Darlington produced effects in a parallel line ten and a quarter miles distant. These results were not conclusive, because it could not be proved that they were not due to accidental connections through the network of wires between those two places. In short, it was doubtful whether they were the result of induction or of conduction. But in 1886 experiments were made on parallel lines four and a half miles apart, between Bristol and Gloucester, where there were no intermediate conductors to vitiate the results. Moreover, the circuits used were metallic throughout. Under these circumstances, only weak disturbances were detected, though when the experiments were repeated in 1889, in the light of experience, more success was obtained. The theoretical possibility of signalling without wires was thus shown, and in 1892 a practical test was made in the Bristol Channel. On Lavernock point, near Cardiff, a copper wire, 1,267 yards long, was hung on poles, the circuit being completed by earth. On the sands at low-water mark, 600 yards from this circuit and parallel to it, two covered copper wires and one bare one were laid down, their ends being buried deep in the sand. On Flat Holm Island, 3.1 miles away, another covered wire, 600 yards long, was laid down. On the shore an alternating current (which was controlled by a Morse key), with a frequency of 192, a voltage of 150, and of any desirable strength up to 15 ampères, was sent through the primary circuit. The signals received on Flat Holm on the secondary circuit produced sound and were read on a pair of telephones. By this means messages were successfully sent. The same method was tried with another island, Steep Holm, 5.35 miles away, but was scarcely successful. Disturbances were indeed perceptible, but the signals could not be read. Such experiments, in which careful precautions were taken to eliminate the effects of earth currents, proved the possibility of signalling between England and France without any wires being carried across the Channel. But the expense would not be negligeable, for at Lavernock Point a two-horse-power engine was required to get results over three or four miles. Mr. Preece also described experiments made with parallel wires about one and a quarter miles apart, stretched on poles along the banks of the Caledonian Canal, near Inverness. Here, with the use of ordinary telegraphic apparatus, Morse signalling was easy, and speaking by telephone possible. Mr. Preece's critics contend that his results are due to conduction through the earth. He himself maintains they are due to electro-magnetic induction. The rapidly-alternating current in the primary circuit throws the surrounding ether into oscillations, and energy is radiated in electric waves. These waves spread out, as do waves of light, and, if they fall on conductors properly placed and sympathetically prepared, are reconverted into an alternate current in the secondary circuit. — *Westminster Gazette.*

PILE-DRIVING. — At a meeting of the Society of Engineers, held at the Town-Hall, Westminster, on Monday evening, March 5, 1894, Mr. G. A. Goodwin, President, in the chair, a paper was read by Mr. Henry O'Connor on "Pile-driving." The author having remarked upon the difference in the formulas, suggested by different engineers for calculating the weight required to sink a pile farther in the ground, exhibited a diagram giving the result of these calculations for two piles, which showed that by one formula only 72 tons would sink the pile farther, whereas, by another formula it would take 300 tons. This great difference was accounted for by the various strata of the ground through which the pile was driven, and which the author said was not sufficiently allowed for, and he then showed a system which he had adopted of finding out the resistance of each layer of the ground, and the force required to withdraw a pile. The author then went on to describe the steam pile-driver used to drive the piles, which afterwards had to be withdrawn, and then touched upon the breaking-load of a pine pillar, and the side pressure which would be exerted at the moment of impact, and the method of obtaining the resistance of the ground, which would be offered to the pile when it had been driven home. The author next mentioned some experiments he had made on the force of the blow, from a monkey falling different heights, and pointed out that the friction against the guides of the pile-driver reduced the blow which the ordinary calculation for a falling weight would indicate. The author described the difficulty which had been recently experienced at Beckton, in getting a large number of cast-iron piles to stand a specified test, and showed various shoes for fitting on the bottom of the piles to prevent them sinking through the thin stratum of ballast which was found there; he then pointed out the shape which was afterwards given to the pile, and which had the desired effect; he then passed on to the effect which the interposition of a hard wooden dolly had upon the blow given by a falling ram, and showed the results of certain experiments to ascertain the loss of effective blow upon the pile. He then gave the result of a test-load placed upon a cast-iron pile, which he had driven to a test of three-eighths inch set, for four five-foot blows, of a one-ton ram, and showed a sketch of a continuous action steam pile-driver used to drive a large number of cast-iron piles. The author then mentioned the enormous blow given in America, when driving a large number of piles, and the effective blow which the pile would receive at the moment of impact, the large blow causing many of the pile-tops to crush. The author having stated what he would consider as a safe load on a wooden pile, driven in such strata as he had already mentioned, as that in which a very large number of piles had been driven under his superintendence, showed a diagram which he had recently got out, and which was the result of an enormous number of calculations, by which the safe load on unsupported cast-iron columns might be easily and rapidly found. The author, in conclusion, gave some comparative figures as to the cost of driving a wooden pile, a cast-iron pile, and making the smallest workable excavation and concreting the same, showing that the cast-iron pile cost about three and a half times as much as the wooden one, while the excavation cost about eight times as much. — *Engineering.*

THE DECORATION IN MOSAIC OF ST. PAUL'S CATHEDRAL. — The decorative works in mosaic now being carried out at St. Paul's are the outcome of an appeal to the public (made as long ago as 1858 by the late Dr. Milman, then Dean of St. Paul's) for subscriptions to a fund to complete the decoration of the Cathedral in accordance with the intention of its architect, Sir Christopher Wren. The amount subscribed in 1871 had reached the sum of £40,000, when, on the occasion of the public thanksgiving held in St. Paul's for the recovery of the Prince of Wales, a special appeal was made, in consequence of which the subscriptions rose rapidly to £56,000. Through careful nursing, judicious investment, etc., this sum two or three years ago had grown to over £90,000. In 1873, the late Mr. William Burges, who had made a special study of the inconography of the French cathedrals, was applied to for the production of designs, to be worked out in conjunction with Mr. Penrose, the architect of the cathedral. A model showing the same was exhibited in the Royal Academy in 1874, but it raised so great a storm of criticism from Churchmen of all degrees that nothing further was done for the moment. In June, 1877, a sub-committee, appointed by the executive committee of St. Paul's to report on the best mode of proceeding in the execution of the decoration of the great dome in mosaic, recommended that the scheme proposed by the late Alfred Stevens (the sculptor of the Wellington Monument), on which he was working at the time of his death, should be accepted; that Sir Frederic Leighton, P. R. A., and Mr. Poynter, R. A., should be commissioned to prepare cartoons for the various panels, and Mr. Hugh Stannus (a pupil of Mr. Stevens) cartoons for the architectural framework of the design. This scheme also was set aside, but it will be remembered that in the Galleries of the Royal Academy in 1892, one of the circular panels, worked out subsequently by Sir Frederic Leighton, was exhibited, the subject being "The sea giving up the dead." It should be noted that for years, work of some kind has been carried on in the great dome, the eight spandrels of which are filled with mosaics executed by the firm of Salviati of Venice from cartoons designed by Mr. G. F. Watts, R. A., by Mr. Townroe from Alfred Stevens's designs, and by Mr. Britten. Statues are also now being placed in the niches of the great drum. — *R. Phené Spiers, F. S. A.*

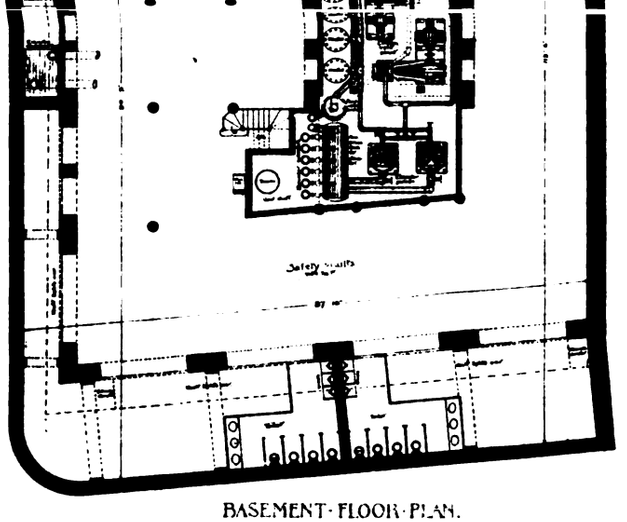
THE ARCHITECT'S CERTIFICATE. — An architect's certificate is always treated with befitting reverence in a law court, and the wit of man does not appear to have discovered any device by which it can be set aside. A coach and six can, it is said, be driven through every clause of every Act of Parliament, if a driver of the right sort can be secured, but no king's or queen's counsel with the aid of a troop of horses can make a certificate less binding on the parties concerned in it. A few days ago it was decided in the Matlock County Court that an architect cannot diminish the value of the document by any subsequent statement. A firm of builders claimed 19*l.* 6*s.* 7*d.* as balance of account for additions to one of the numerous hydropathic establishments in that charming district. It appears that the extras on the contract, as certified by the architect, amounted to 259*l.* 16*s.* 7*d.* The builders agreed to accept 250*l.* if the money were paid at once. A sum of 240*l.* was given to them. As they could not obtain the balance, they were obliged to sue for it. The defendants pleaded that the contract was not stamped. The judge overruled the objection on the ground that there was admission of the work being done, and, moreover, the architect had certified it was finished. The architect was then brought up to testify about some work being still incomplete, and how he had told the builders not to present the certificate until all was carried out to his satisfaction. In reply to the judge, he admitted that the certificate was not entirely accurate. The judge said there was no getting over the certificate, which declared that the work was complete in September last. It was right to withhold some money for unfinished work, but the acceptance of 250*l.* for an account amounting to over 259*l.* was evidence that a sufficient allowance had been already agreed to on that head. His Honor, therefore, held that, in addition to the 7*l.* 7*s.* 3*d.* lodged in court, a further sum of 10*l.* must be paid. The amount in dispute was not large, but the decision that an architect cannot explain away his own certificate is important. We believe the only judgment to the same effect has been given in the Supreme Court of New York. — *The Architect.*

PARIS HOT-WATER FOUNTAINS FAIL. — Disappointment has resulted from the establishment, in Paris, of the hot-water fountains, which, it was thought, would be so useful to the public and particularly to poor people, who cannot afford to have a fire at all times at their homes. The water is delivered from automatic machines. Put a halfpenny in, and you get eight litres of water (about fourteen pints) at a temperature of 60° Centigrade — that is to say, 140° Fahrenheit. A contractor made arrangements with the Municipal Council whereby he was guaranteed the monopoly of the business, and eighty machines were put up in different parts of the city. They have not, however, been a success. Sometimes the would-be purchaser puts his halfpenny in and gets nothing but a copious douche of cold water, which he could get at the nearest pump for nothing, but more often he gets no return at all. Out of the eighty machines, it was found on an official inspection the other day that only fifteen were in working order. They are covered by puffs of tradesmen's wares, and it was hinted, at a discussion on the subject at the Municipal Council, that practically they had become nothing but advertising stations. The contractor is to be compelled either to supply the hot water or retire from the business. — *The London Daily News.*

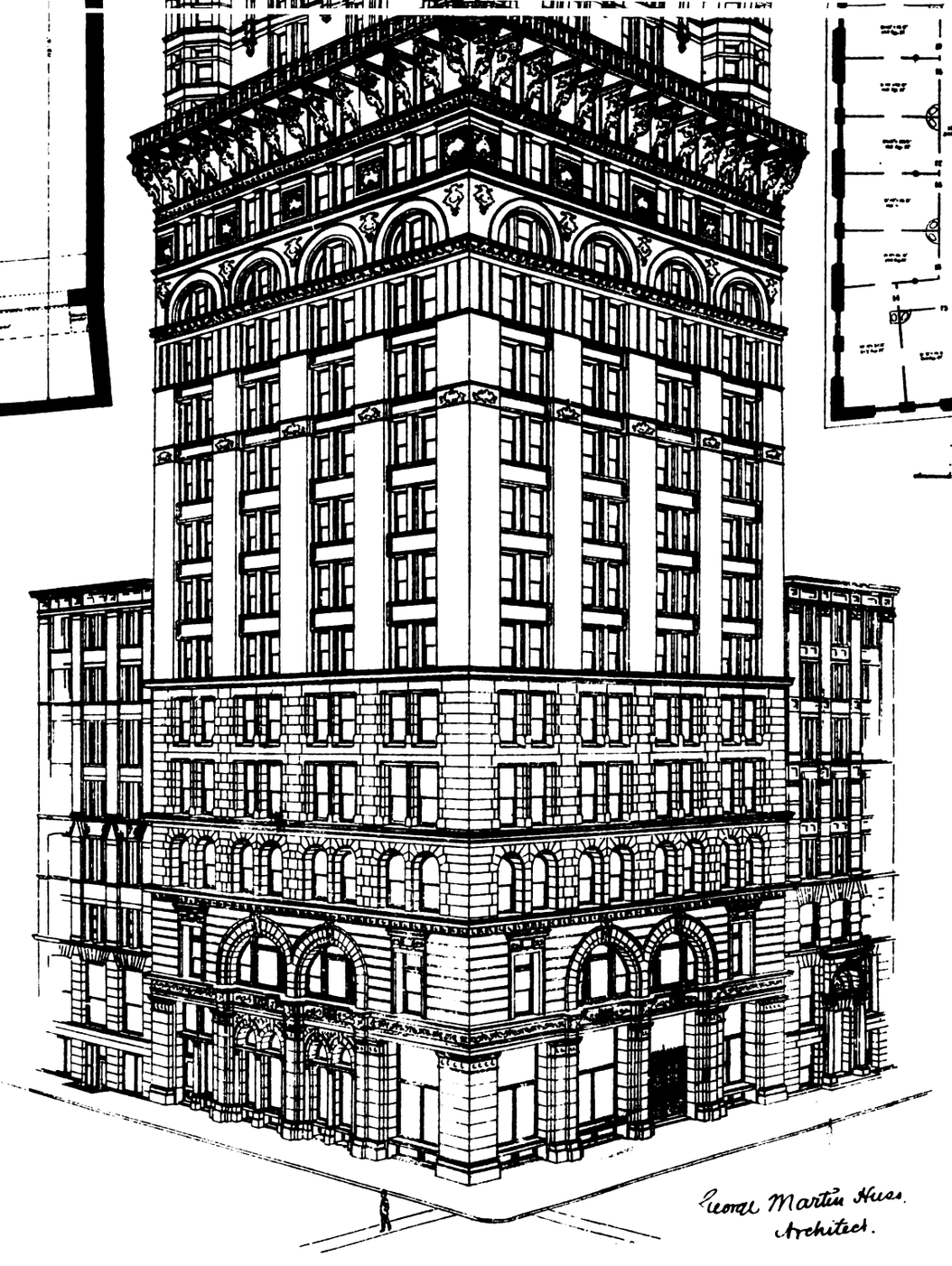
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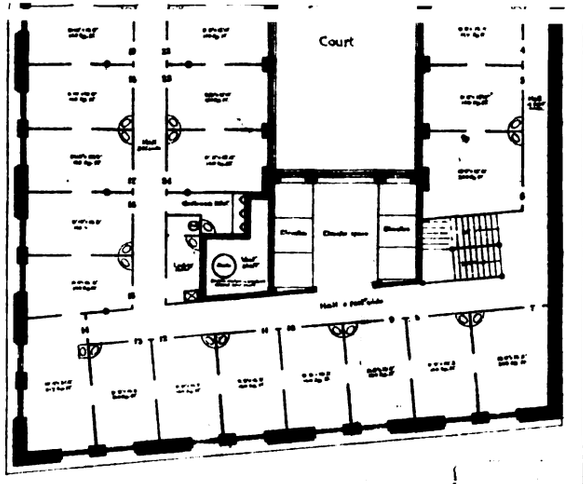
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BASEMENT-FLOOR-PLAN.





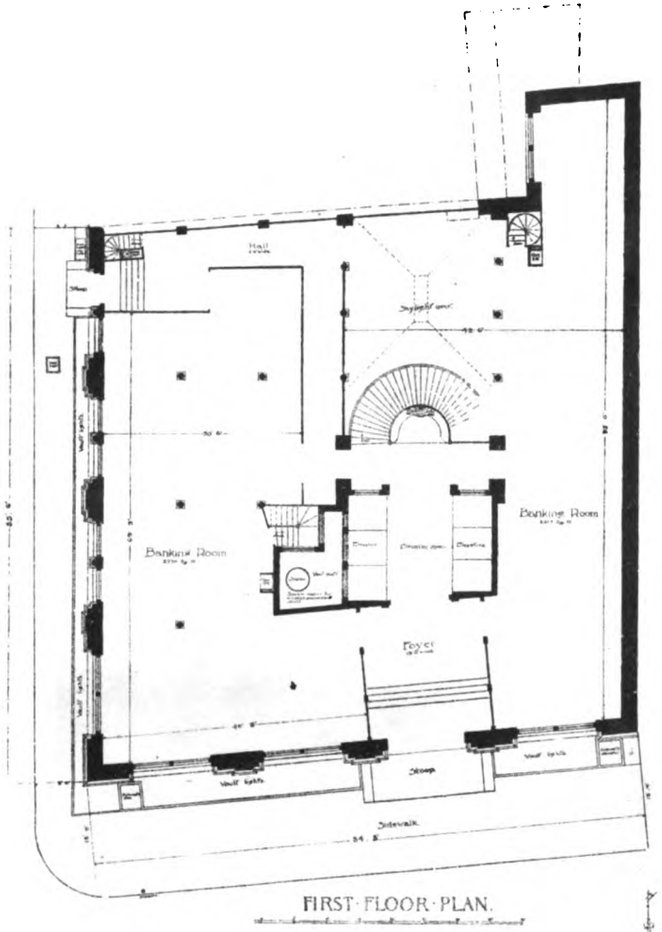
TYPICAL FLOOR PLAN.

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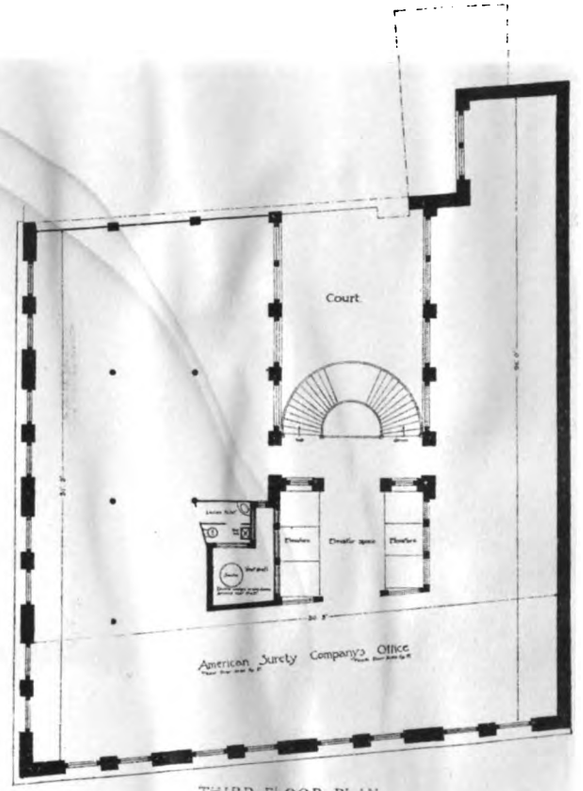
COMPETITIVE DESIGN FOR AMERICAN SURETY COMPANY'S BUILDING, NEW YORK, N. Y.

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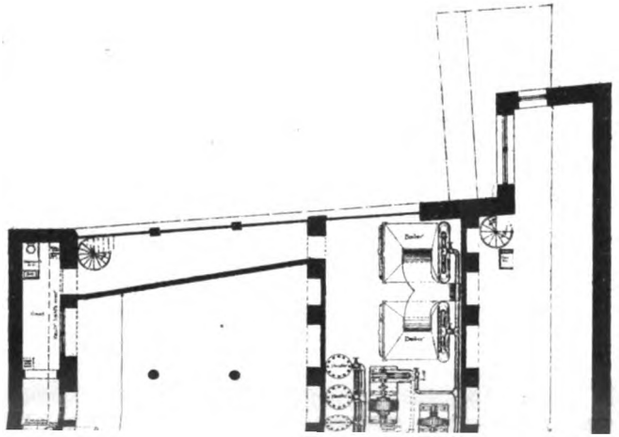
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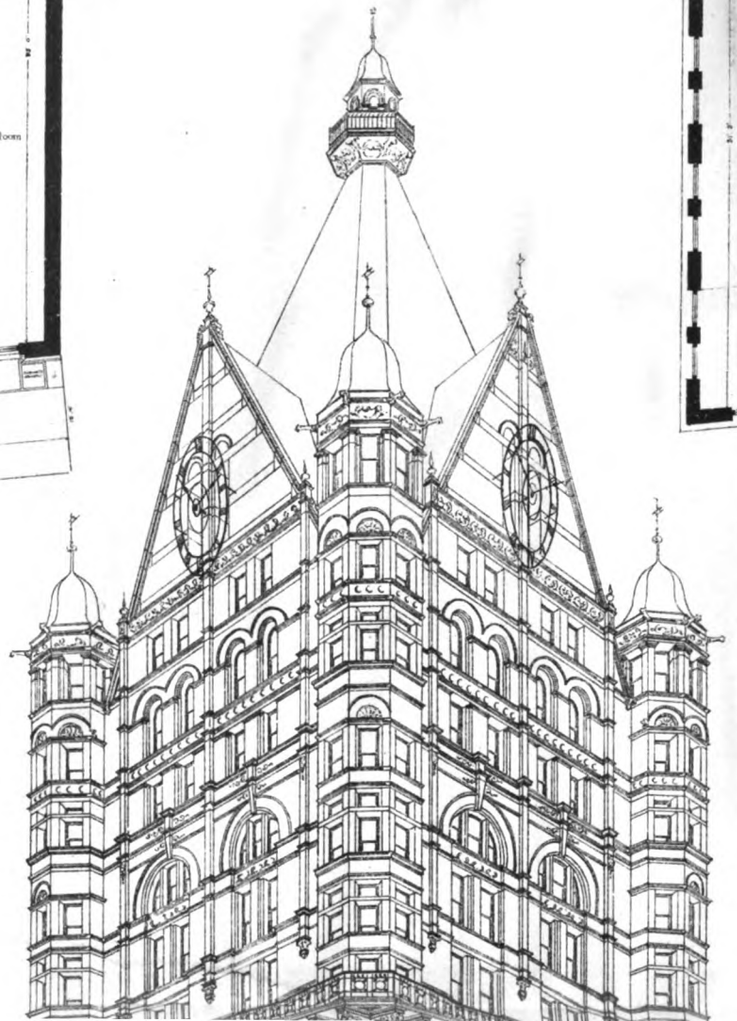


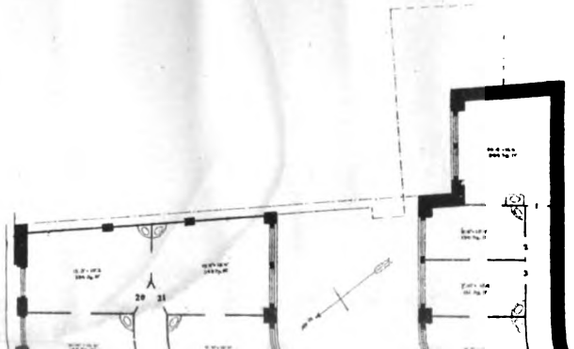
FIRST · FLOOR · PLAN.



THIRD · FLOOR · PLAN.
FOURTH · FLOOR · PLAN.







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THE TARRANT BUILDING, NEW YORK, N. Y.

HENRY RUTGERS MARSHALL, Architect.

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FRAGMENT OF A VENETIAN FACADE.

MISS K. M. HUGER.

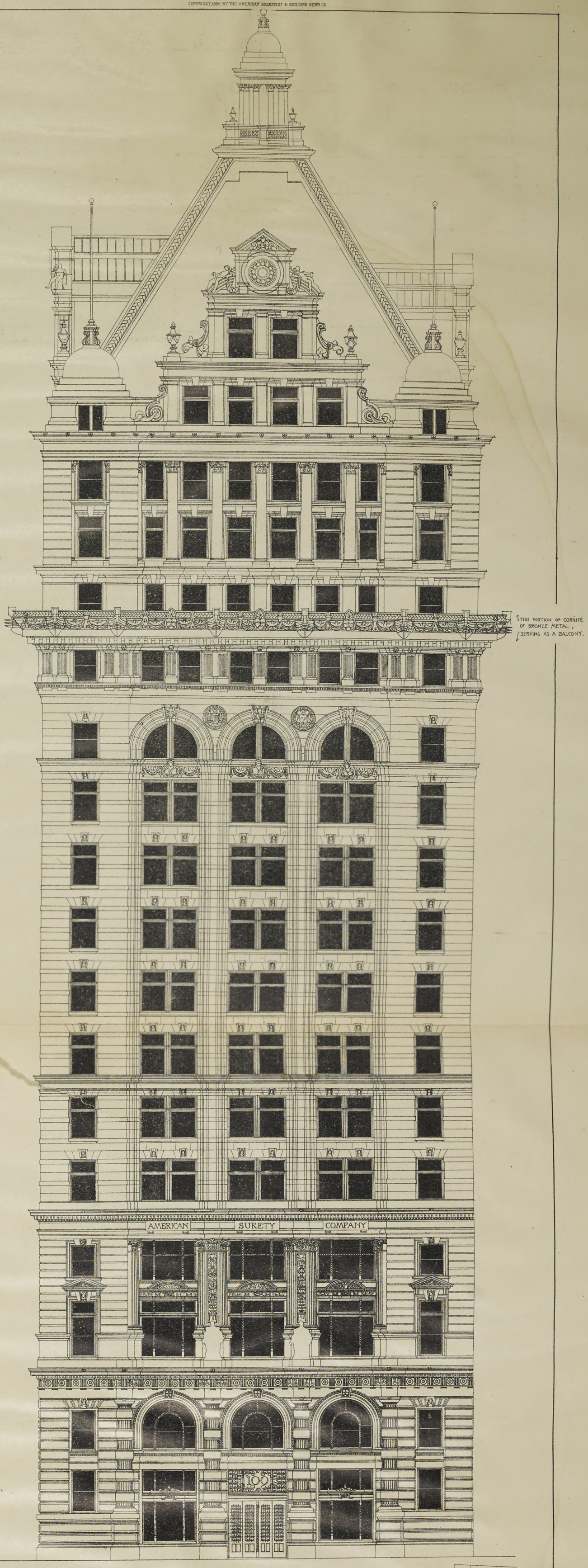
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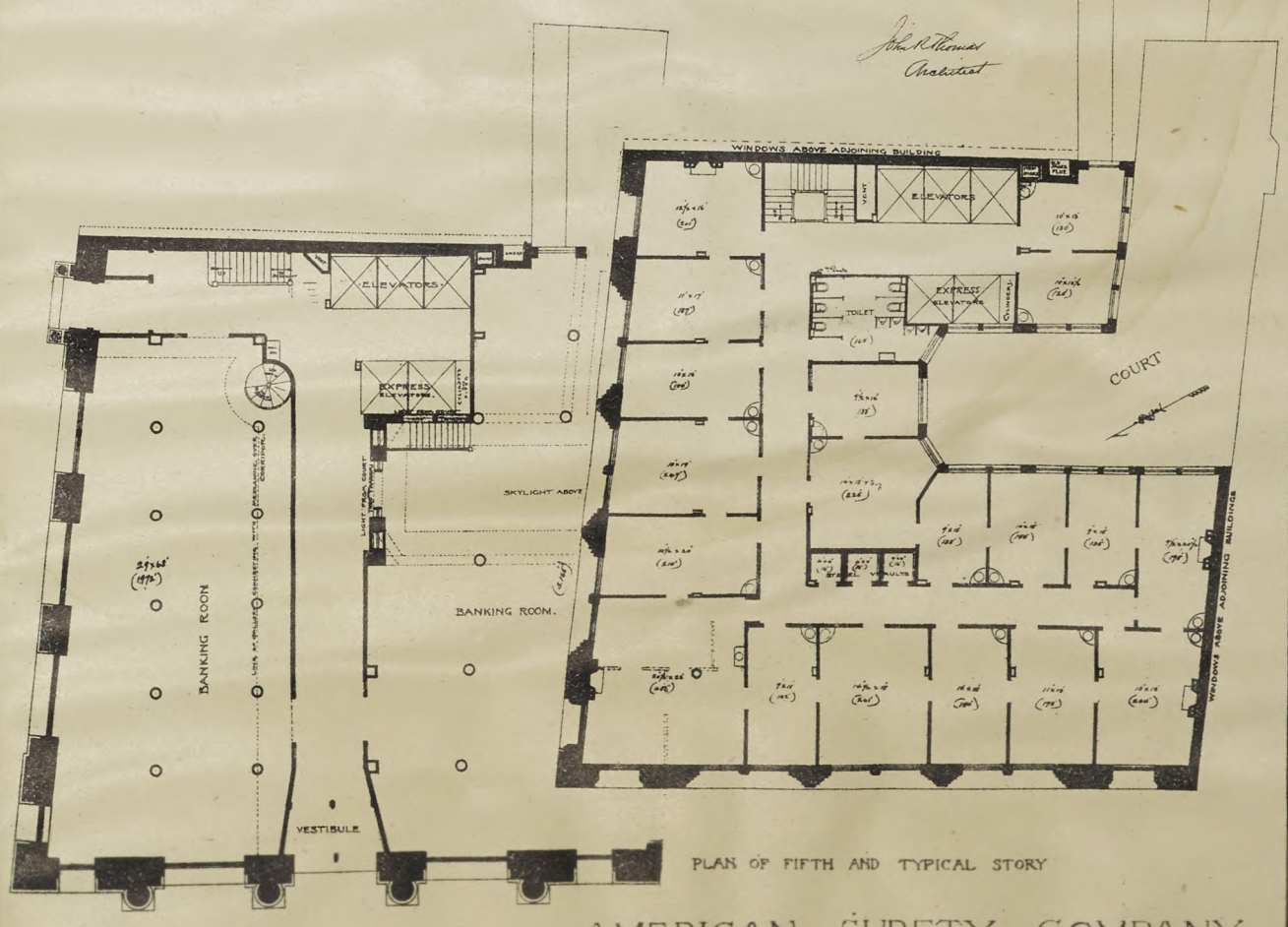
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ELEVATION ON BROADWAY



PLAN OF FIFTH AND TYPICAL STORY

SCALE ¼ INCH = 1 FOOT

PLAN OF FIRST STORY

AMERICAN SURETY COMPANY

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THE AMERICAN ARCHITECT AND BUILDING NEWS.

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MAY 12, 1894.

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THE bill before the Massachusetts Legislature, providing for a subway under Tremont Street, with, perhaps, branches in other directions, has been disposed of, apparently in deference to the opinion of some twelve thousand citizens and tax-payers, who joined in an earnest protest against the scheme. Unfortunately, however, as it seems to us, the Legislative Committee has joined with its unfavorable report on the subway plan a strong recommendation in favor of granting extensive franchises to a corporation using a new sort of single-rail elevated structure, and allowing it financial privileges which seem very little in accord with ordinary prudence. Concerning the Tremont Street subway scheme, our opinion has always been that it contemplated the expenditure of an amount of money quite inadequate to the results to be accomplished. Of all routes in Boston for an underground passageway, the line of Tremont Street is perhaps the least suitable. In practice, there would be only three points on the line where passengers could alight and climb to the upper air. One of these would be at Warrenton Street, one at West Street, and one at Scollay Square. Between those points, the tunnel could just as well be in the depths of the sea as under Tremont Street, and both Scollay Square and Warrenton Street are places which have no importance in themselves, except as being points where several converging surface lines meet. Of course, the idea of connecting these meeting points is the fundamental one of the subway, but why they should have to be connected by a route under a crowded street is not so apparent. No doubt, at certain hours of the day a large percentage of the passengers, coming in either direction, would alight at West Street, but these might just as well reach West Street, from Bowdoin Square or the Northern stations, and from Warrenton Street or Park Square, by a tunnel built under Beacon Hill and the Common, where it would neither disturb or undermine anything on the surface, nor be itself obstructed by sewers and pipes, as by one cut through the infinite maze of sewers, gas, water and electric conduits in under Tremont Street, at the risk of undermining and destroying many million dollars' worth of buildings along the route.

HOW far an elevated railway will prove preferable to the proposed subway remains to be seen. While we think that a tunnel under Beacon Hill, from Causeway Street to Park Square, with a station at the West Street gate of the Common, would, while a very inexpensive affair in comparison with the subway, be of immense benefit to the city, there is no doubt that more rapid communication on what may be called radial lines, diverging from Park Square and Causeway Street, will soon become also necessary, and, as tunnelling for these lines would be impracticable, an elevated road furnishes the only other available solution of the problem. Our own prejudices tend rather strongly against the Meigs system. This employs a single line of posts carrying three rails. Two of these run at the sides of the posts, one line on each side, being thus separated by a distance of five or six inches. The wheels of the locomotive, or other motor, are set at an angle with the horizon, forming nearly a V, and, of course, running on these rails. On the top of the posts, between the upper portion of the arms of the V, is another rail, which is gripped by small horizontal driving-wheels. These driving-wheels are pressed against their own rail by hydraulic power, or some similar force, which take the place of dead weight in securing the adhesion of the drivers to the rail; and the car, the body of which runs above the upper rail, is thus towed along by the movement of the driving-wheels on the upper rail, and kept from falling over on either side by the inclined wheels running on the lower rails. Although the equilibrium of the car, under unfavorable circumstances looks to the uninstructed eye doubtful, the system has the great advantage that the posts and rails would cast almost no shadow, and occupy an almost inappreciable space. As compared with the broad and ponderous structure of the New York elevated roads, the Meigs railway would be hardly visible, and we agree with the Legislative Committee in thinking that the damage inflicted on estate bordering on the line would be nothing in comparison with the increase in their value for business purposes.

AMERICAN INDUSTRIES, for April 21, which is a journal, seemingly, more devoted to politics than to any other form of American enterprise, contains an article on the designing of our public buildings, which has the outward air of being an "inspired article," since it is accompanied with a large portrait and a biographical notice of the present Supervising Architect. The writer, whose text is that private architects are simply agitating the matter because they selfishly wish to pocket the fees, asserts that he has made a "thorough examination of the history and practice of the Supervising Architect's bureau" and declares that "the figures at the close, showing that the cost to the Government has been less than five per cent of the cost of each building, make a very strong argument in favor of continuing the old arrangement." Naturally, we turned with much interest to the "close" of the article, but found there only these words: "The records of the office show that the amount paid for said services never exceeds five per cent on the cost of the buildings erected." Curious *proof* this! If Mr. Glenn Brown's statements and deductions are to be overset, in can only be done by producing the proof and the figures that support it; they cannot be overset by bold, unsupported assertion. Until, then, a trustworthy contradiction is furnished, it may be taken as proved by ample evidence that, far from being erected at a cost of five per cent for architectural service, the service provided by the Supervising Architect's office costs the country nine per cent of the nominal cost of each building, while the cost of the building is so inflated by delays, bad methods and political exigencies that the cost to the people of architectural service on each building is equivalent to fifteen per cent on what the cost of such a building would have been if it had been under the charge of a competent architect in private practice. Add to this the sums paid for office-rent, for the difference in time between the completion of the building by one method and by the other, and it is found that instead of the one-twentieth portion that a private architect requires, the Government bureau is found chargeable with nearly one-fifth of the huge sums which the people pay for public buildings, largely to enable certain Congressmen to draw comfortable salaries and stay away from the work they are supposed to be paid for attending to.

MR. JOHN LYMAN FAXON, of Boston, has conceived the very commendable idea that it would be advantageous to the pupils of the public technical schools, including the evening-schools in which mechanical drawing is taught, to

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have better examples of such drawing put before their eyes than the copies now commonly used; and he proposes that architects, most of whom have plenty of drawings stored away which would never be used again, should present such examples of plans, elevations, sections and detail-drawings as they think would be useful to schools of the sort. He proposes to make a beginning in Boston, by calling upon the architects of that city to make contributions, to be delivered at his office, 7 Exchange Place, on or before Saturday, May 19, and has arranged with the School Committee to have such contributions permanently hung on the walls of the new Mechanic Arts High School. It is much to be hoped that his appeal will meet with a hearty response. Besides the city schools, nearly every town now supports evening-schools, where what purports to be architectural drawing is taught. Many architects have seen, and laughed over, the pitiable examples which are presented to the pupils in such schools as models of architectural drawing, but it does not seem to have occurred to any of them, before Mr. Faxon, that the architects themselves, by supplying better models, could greatly increase the value of the instruction given in the schools, and render an incalculable benefit to the poor, but ambitious boys who frequent them. We print Mr. Faxon's letter in full in another column, and again commend it to the attention of our readers generally, and of Boston architects in particular.

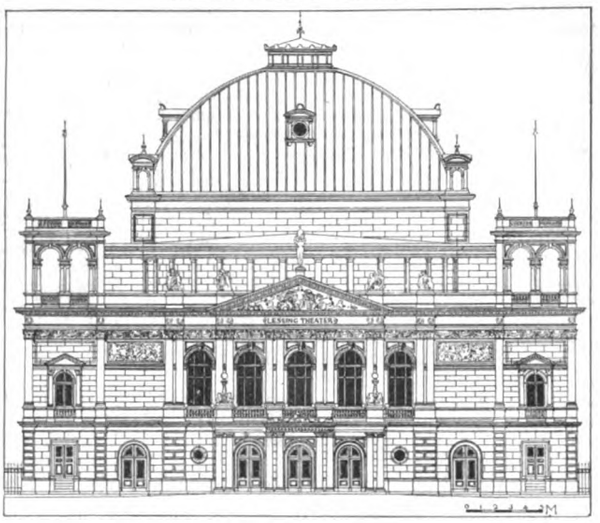
THE daily papers are taking an unusual amount of interest in insurance matters just now, and it may be hoped that the results will be valuable. The Boston *Herald*, after pointing out that the number of fires due to playing with matches, allowing stoves or furnaces to become overheated, or dropping lighted cigars, or pipe-ashes, into inflammable material; or, in other words, to gross carelessness, has increased enormously within a few years, repeats the well-known suggestion that this evil might be diminished by restricting insurance to 80 per cent of the value of the property insured. The *Herald* is very good authority on insurance matters, but it has never seemed to us that this restriction would have the desired effect. In cities and towns, where most of the destruction by fire occurs, the loss seldom amounts to 80 per cent of the full value of the property insured, and people who liked to be careless with matches could reckon with confidence that the salvage effected by the efforts of the firemen and insurance patrol would amount to 20 per cent on the amount of the policy, so that the indemnity would really cover the loss; while people in the country, who rarely have full insurance, in any case, would think much more of the inconveniences of being turned out of their dwellings than of such a paltry amount as the *Herald's* plan would employ for teaching them to be careful. To our mind, a much more effectual remedy against carelessness, and one which would find its application just where it is most needed, is that which we have often advocated, and which has made Paris, Berlin, Vienna, Madrid and Rome proof against extensive conflagrations, — namely: to hold every property-owner responsible to his neighbors for losses caused them by fire spreading from his building to theirs. The growing necessity for some such regulation, which, we venture to say, will be generally adopted before many years, after we have spent a thousand million dollars or so more of our hard-earned money in demonstrating the importance of it, is well shown by a story from the Cincinnati *Commercial*. According to this journal, a mercantile building was recently burned in Ohio, with a loss of $75,000. After the fire, it was found that the building had been nearly saturated with petroleum. Strips of cloth, soaked in kerosene, had been laid on the stairs, to conduct the fire from floor to floor, and a barrel of oil had been placed on top of the elevator car, which had been stopped halfway between two stories, for convenience in setting fire to both. Naturally, the Underwriters will object to paying the loss, and the circumstances would certainly justify a suspicion that the stock had been over-valued, as well as purposely destroyed; but, under the contract of insurance, the Underwriters cannot demand a valuation or examination until a claim for loss is made, and meanwhile, the owner is said to be, at his leisure, collecting the salvage, and destroying the rubbish, and with it, as the Underwriters fear, the evidences on which they must rely to prove either over-valuation or incendiarism. Whether the suspicions of the companies are justified in this case or not, there is no doubt that vast sums are contributed by premium-payers, and applied by the insurance companies, to pay for property destroyed by fire which the owner is glad to have out of the way, and sells to the Underwriters, that is, to the people who pay the premiums, with much rejoicing. Arrests for incendiarism, even if the owner's willingness to dispose of his property to the companies has gone as far as this, do not avail much in a community always prejudiced in favor of the individual, against the corporation; but a great deal might be done by the knowledge, on the part of the owners inclined to toss their cigar-ends among their bales of unsalable goods, that a fire carelessly set on their premises might bring upon them ruinous demands from the owners or insurers of adjoining property. Even if a man were well-meaning, but careless, the knowledge of his responsibility would do much to sharpen his perceptions in regard to the prudent use of fire by himself and his subordinates; and it is certainly due to the conscientious people who take proper care of their premises to provide some remedy against the perils to which they are exposed through the recklessness of their neighbors. Concerning the influence which such responsibility, which was a part of the law of every civilized country, until abolished in England, by special statute, within comparatively recent times, would have on building methods, we have already written at length; and it might be well to remind the insurance companies, in whose hands the matter really rests, that the present is the most favorable time that the present generation has ever seen for introducing building-reforms. Not only is structural iron, the foundation of fire-resisting construction, much cheaper in this country than it has ever been before, but the stagnation of building business gives an unusual opportunity for the discussion of improvements, which can be put in shape for general adoption when the revival comes, which is surely on its way.

SEVERAL of the more thoughtful technical and real-estate journals have lately expressed serious doubt whether the enormously high office-buildings now fashionable in our cities will prove, in the end, profitable investments. In Chicago, where they have had a longer trial than elsewhere, their construction has been abandoned, nominally through statute prohibition, but really, it cannot be doubted, with the acquiescence of the people most interested; and it is said that several of the Chicago "sky-scrapers" have never yet been profitably rented. In New York and Boston, where land is very costly, two hundred dollars a square foot having been paid for lots in a good location, there is some excuse for multiplying stories, but it may be doubted whether the practice will prove profitable even there, particularly if it should be extensively followed. Where two buildings, sixteen or eighteen stories high, occupy opposite sides of a narrow street, like those in the business part of Boston and New York, the light in the lower stories is none of the best, and it has been found, in nearly all buildings of the sort, that the upper offices rent first. Originally, the rents charged diminished as the height above the ground increased, and this was supposed to account for the greater popularity of the upper floors; but it is now the practice to charge more for the upper offices, and, even then, they are apt to be rented first, the abundant air and light proving an irresistible attraction to tenants. This state of things will probably last until an earthquake shock, such as is due in New York once in twenty years or so, throws down the upper portions of some towering structure, or, what would amount to the same thing, makes the tenants think that it may do so. Then, offices fifteen stories above the ground will cease to command a premium, and tenants will look for rooms where they can get good light and air, within six stories above the street. When this happens, the "sky-scrapers" will have to be rented for storage, as some of them are said to have been already. If provision is made for this at the outset, no great harm would be done, as such buildings, being fireproof, well supplied with elevators, and conveniently situated, make excellent storage-warehouses, and would always bring in a moderate rent in that form; but many of them are designed only for light office loads, and could not be utilized for storage without great danger, unless entirely reconstructed; so that it is certainly the part of prudence for owners and architects, as well as Inspectors of Buildings, to see that sufficient strength is given them for all contingencies.

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THEATRES. — II.

LESSING THEATRE, BERLIN.



Lessing Theatre, Berlin, Prussia. Von der Hude & Hennicke, Architects.

IN the preparation of these articles I have thought it advisable and expedient for various reasons to alternate the consideration of the plans of the theatres of the English speaking countries with those of the Continent. I am, therefore, presenting to-day, through the help and intervention of Mr. Edwin O. Sachs, some drawings of the new "Lessing" Theatre in Berlin, of which Messrs. Von der Hude & Hennicke were the architects.

Of this firm of architects Mr. Hennicke died some two years since and it is through the permission of Mr. Von der Hude that the plans are now reproduced. When the plans have been carefully studied by those who follow this subject with any previous knowledge of the great difficulties to be overcome before designing a satisfactory theatre plan, I think they will express surprise in hearing that this plan was produced by architects who were not theatre specialists, and that this was their first building of this class.

This theatre, which is the private property of Dr. O. Blumenthal, was begun in 1887 and completed in September, 1888, and is, therefore, one of a class of recently erected Continental theatres, built, however, prior to the passing of the new Berlin regulations, which were passed in December, 1889. The site is an isolated one, allowing of exits on all sides, and the plan is a symmetrical one, one side of the theatre being planned exactly like the other, with corresponding exits and passages on either side of the house. This is an admirable and safe arrangement, as the audience soon become aware, with a simple and symmetrical plan, that whichever side of the auditorium they enter, there is an exit in the same position on the other side; there is, therefore, no feeling of fear in being seated away from the entrance door, as the farther from the entrance door one is, the nearer he comes to the exit — which corresponds to that entrance.

This theatre was built for comedy, and occasional opera performances. The study of these plans and those of Daly's Theatre, produced in the *American Architect* for April 14, will give an interesting comparison of the varied arrangement between English and Continental theatres.

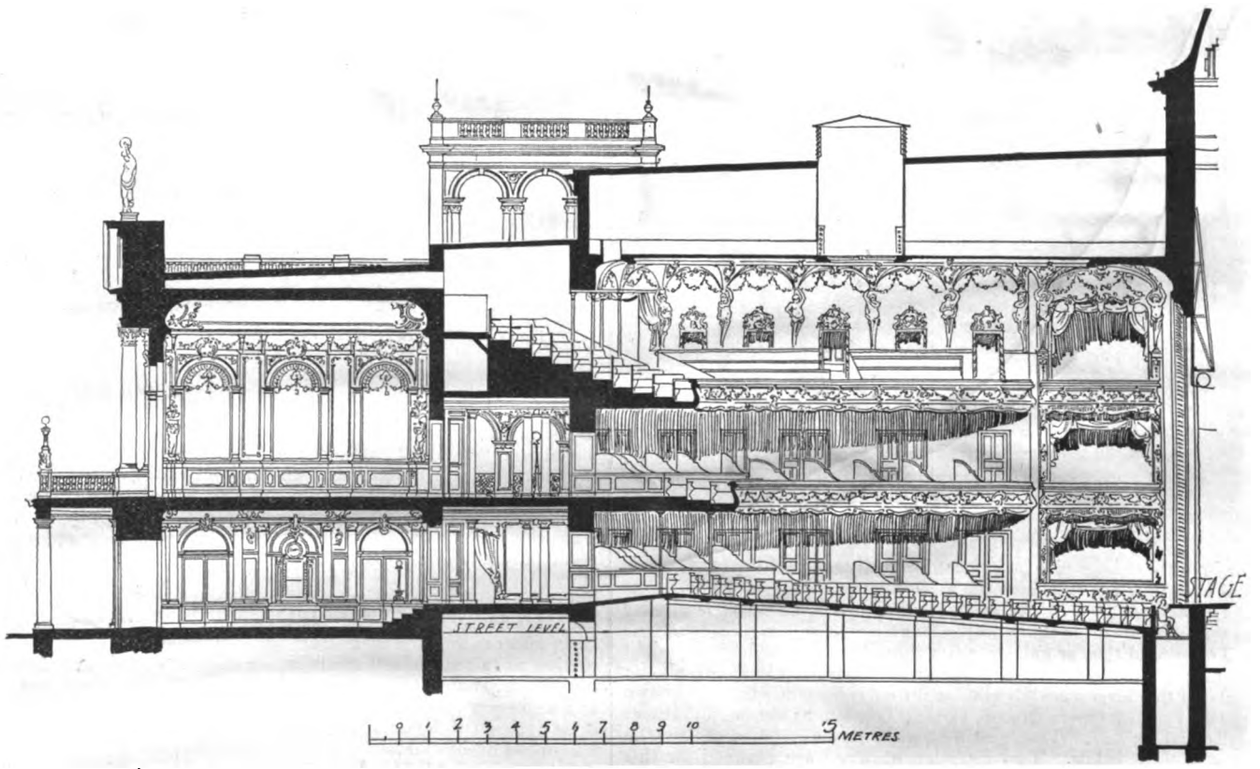
The main entrance to the Lessing Theatre is by a vestibule on the ground-floor level, which is also the level of the parquet or stalls. From this vestibule, right and left, are staircases leading to the second tier, while inside the main walls are again to be found two separate staircases, right and left, leading to the first tier.

The special features about the arrangement of these staircases is this, that they all have one common entrance through the vestibule, so that no matter what part of the house your seat may be in, you can alight from your carriage at the main entrance and reach the part of the auditorium from whence you are to witness the performance, by passing through the vestibule. Now it would be said, if reference were not made to the plans, that this arrangement of all staircases leading to one common vestibule was most objectionably dangerous in case of a sudden rush towards the exit, and that at any time it would create an unmanageable crowd in the vestibule after the performance, but the architects of this theatre have been far too thoughtful of the comfort and safety of their audience not to overcome this, and have cleverly provided a direct and separate exit from each staircase into the open air, without entering the vestibule at all.

The seating capacity of the house is eleven hundred. On the main floor of the house there are four hundred and thirty stalls, while provision is made for one hundred and twenty-eight in the stage-boxes and private boxes on the parquet level. The arrangement of the stall seating and the gangways and extra exits, one on either side of the house, are so clearly defined upon the plans, they need no further reference from me. The disposition of the private boxes behind the stall seats is one more frequently adopted in opera houses.

On the ground-floor plan is shown the stage, which is nearly square, being sixty-two feet seven inches wide by fifty-nine feet two inches deep, with a proscenium-opening of twenty-nine feet nine inches in width; at the back of the stage is an ample scene-dock which is divided therefrom by a solid wall.

The dressing-rooms, it will be seen, are situated on either side of the stage and are separated from it, not only by substantial brick-walls of great thickness, but by a passageway. Each section of dressing-rooms has a separate staircase with a direct exit into the open air. I would draw attention to the location of the sanitary and lavatory arrangements, both before and behind the curtain, and



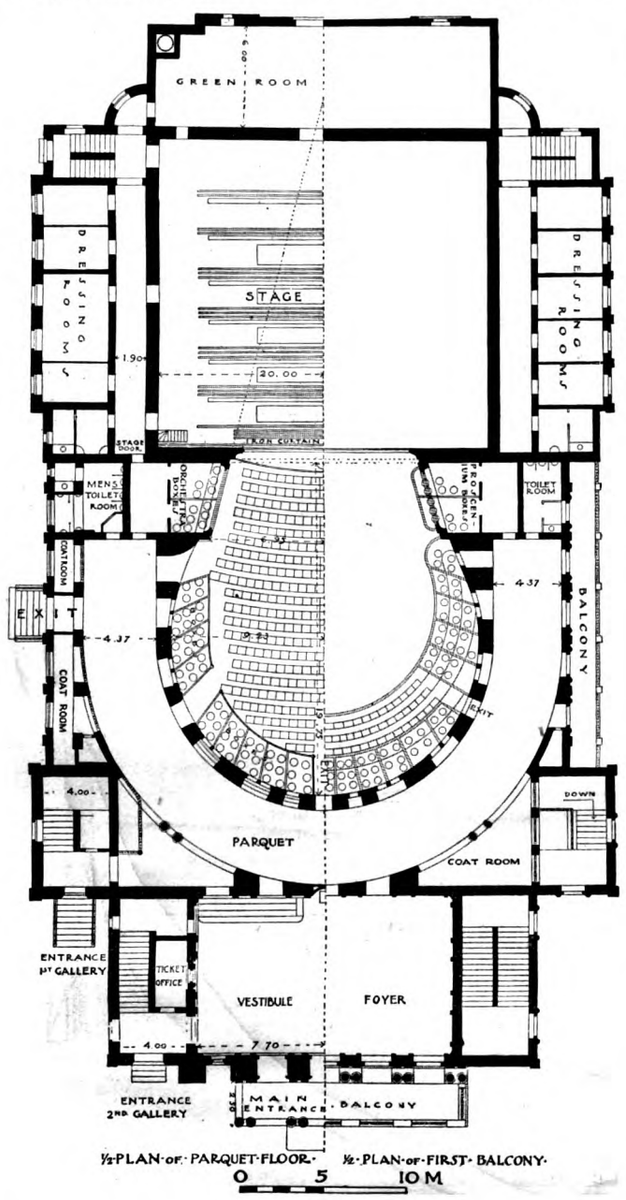
[1] Continued from No. 955, page 20.

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the clever way in which they are planned, so as to be placed in two groups next to outside walls, affording perfect ventilation and economy in arrangement.

The first tier is provided with two hundred and fourteen seats, divided between three rows of "circle" seats and a series of private boxes. The wide corridor which surrounds this tier, as well as on the parquet level, is a special advantage to the theatre, as there is sufficient room, and to spare, in these corridors for the occupants of the seats on the tier.

Over the vestibule is the Grand Foyer, the architectural treatment of which can be gathered from the section which is given herewith. It will be noticed that the angles formed by the square walls of the building and the circular walls of the auditorium, are adapted for the use of cloak-rooms. On this tier on either side of the house are provided outside balconies, affording pleasant retreats in hot weather, and additional safety to the audience in case of fire,



for from these balconies people can be easily reached by fire escapes, and here they are safe from the asphyxiating effects of smoke.

The arrangement of the second floor of dressing-rooms is similar to that described for those on the stage level.

The second tier, or gallery, seats three hundred and twenty-eight people; with the exception of the proscenium private boxes, all the seats on this level are stall seats, and they represent what are known in the English Opera House, Covent Garden, as the amphitheatre stalls and gallery. The lavatories and dressing-rooms follow the lines of those below. Two refreshment-rooms are planned on this level.

The construction of the building is almost entirely of fire-resisting material, so-called, fireproof wood having been used only for the stage flooring, the box partitions and the lathing of the cupola. It seems, however, a pity that the two last details were not carried out in fire-resisting materials. The floors of the house are mostly vaulted, some few being in sheet-iron.

The total width of the exit doors as compared with the numbers the house will hold gives a proportion of about three feet for every eighty persons.

Some of the chief measurements of the theatre are as follows:

Width between main walls of auditorium	59 ft. 3 in.
Depth from back wall of auditorium to proscenium	62 " 6 "
Depth from first tier box front to proscenium	48 "
Depth from second tier box front to proscenium	52 " 6 "
Depth from back wall of gallery to proscenium	82 "
Width of proscenium opening	29 " 9 "
Width of stage	62 " 7 "
Depth of stage	59 " 2 "
Width of main corridor	13 " 3 "
Size of vestibule	49 ft 4 in. by 29 " 9 "
And the size of foyer about the same size as the vestibule...	
Width of staircase between containing walls	13 " 1 "

All the scenic and technical apparatus is said to be quite up to date, and the fire-protecting appliances most sufficient, with high-pressure hydrants supplying the whole of the house.

The stage is divided from the auditorium by an iron curtain made in two sections and moving from the sides on rollers, not lifting as is the usual method adopted for moving the "fire" curtains. The flies are of iron with boarded floors and the stage bearers are of iron. There is nothing very special in the form of construction to call for particular description.

The decoration of the auditorium is carried out in white and cream-color, with a small use of gold, the relief being obtained by the rich, blue plush upholstery of the chairs and hangings.

The site covers 2,300 square metres and the cost of the building about £56,900.

The theatre, at the time of its erection, was the first private theatre to be built in Berlin, after a lapse of twenty years.

[To be continued.]

THE CHURCH ORGAN, ARCHITECTURALLY AND ARCHÆOLOGICALLY CONSIDERED.[1]—I.



Relief on Bach's Monument, Eisenach, Germ'y, by Prof. Donndorf

AMONG all the elements connected with the modern revival of liturgical propriety and artistic beauty in the Church of England, few matters of detail should have more interest for the architect than the treatment of the organ. In the first place the arrangement of this necessary and bulky piece of church-furniture is of much importance to the architect as a professional man; and secondly, as a churchman, and, let us hope, an artist, it affords him a subject worthy of his best talents in so far as relates to its external appearance.

There is nowhere to be found an instrument which creates so much enthusiasm among players as the organ. And the reason is simple. The organ, in its various capacities, far outstrips any single instrument of the modern orchestra. The enormous tonal compass from the grave thunder of the 32-feet pedal to the highest ranks of the mixtures; the majesty of its full power and the delicacy of its soft stops; the beauty of its mechanical contrivances, and last though by no means least, the architectural magnificence of the ancient examples which remain in many parts of Europe, all combine to make the organ a fitting object for admiration for every lover of music and archæology.

I do not propose this evening to say much about the strictly musical characteristics of the organ, because such would be more fitting in an address to an audience of musicians, but I propose to call attention more particularly to the archæological history of this grand instrument, showing how the workmen of the Middle Ages treated it as a necessary piece of church furniture, and how they lavished upon it, as upon all things, the highest arts of architecture, painting and sculptured decoration.

It is very remarkable that, of all objects in a modern church or music-room, the organ is nearly always the most ugly and meagre in its external appearance. Large sums are necessarily paid for fine instruments, but the smallest possible amount is expended upon the case or woodwork enclosing it, while most organists would, I fear,

[1] A paper read by Arthur G. Hill, M. A., F. S. A., at the meeting of the Society of Architects, on December 11, 1893.

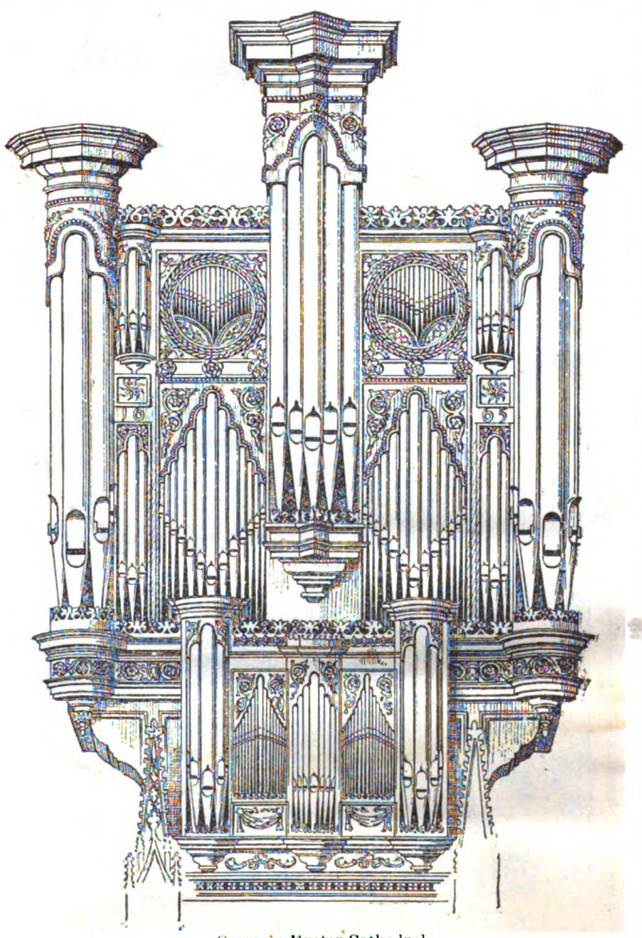
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willingly go without a case, if such loss would allow of an extension of the musical resources of the manual or pedal organs. Thus most modern instruments possess nothing at all which can honestly be called a case; while on the other hand, where exceptions occur, the architectural treatment of the woodwork is so utterly bad, that those who have studied the external features of ancient organs see nothing but the most painful vulgarity, or the most ludicrous embellishments, in an object so grandly treated by the craftsmen of old.

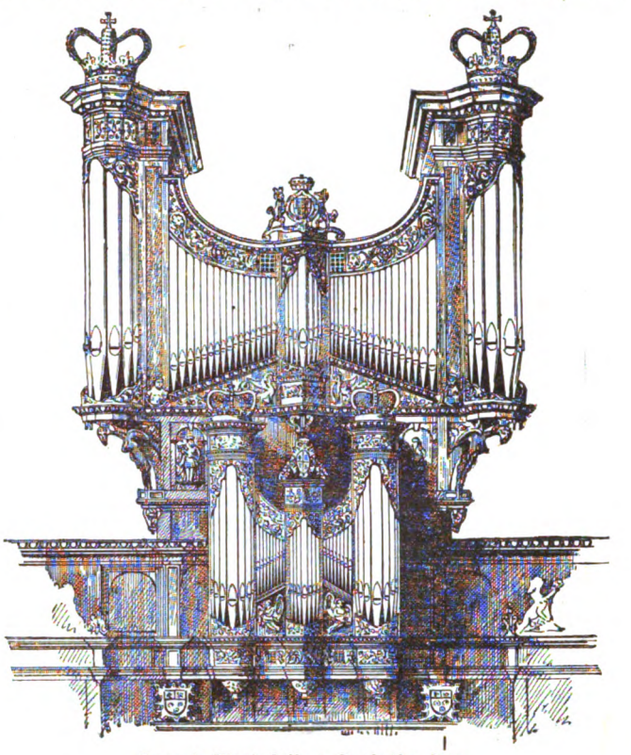
This age, in all matters of art except music, is essentially revivalistic. The finest modern churches or other buildings are those which are the most like ancient examples; the greatest painters strive to reproduce the style of some particular master of past times and we are forced to acknowledge the unpleasant fact that we have reached a period when traditional art has practically died out. Music appears to go on developing, but unfortunately it is not so with architecture and the kindred arts. We have absolutely no traditional style extant. With the dying out of the Byzantine influence in the twelfth century came the strict Gothic art which produced the noble cathedrals and other buildings of the thirteenth and two succeeding centuries; then followed a revival — the Italian Renaissance, which produced, in Gothic outlines, the classically clothed works of Bramante, Michael Angelo, Wren, Inigo Jones and Gibbs. This influence was of comparatively short duration; it was fast dying at the close of last century, and in the year 1893 we see the last link with the past in matters of architecture broken, perhaps beyond repair, and an indiscriminate revival of all past styles, of all centuries and of all countries, takes the place of arts which ought to be the true offspring of the particular age in which we live. The result is that what is really original in modern architecture is almost always exceedingly bad in everything except construction, while the absence of tradition makes the designer in ancient styles fail in all cases except where a very close and artistic study of original examples has been made, and this is but rarely attained.

Being in this position, the best we can do is to study with the greatest care the works of past times, and by applying them, and adapting them to modern requirements, strive to develop a new school of architecture and decoration more beautiful than the vast majority of the works which are day by day manufactured, so to speak, by the yard or by weight, and which are artistically valueless.

To this end I bring to your notice the collection of drawings of ancient organs which is exhibited here to-night, either by the lantern or by the lithograph reproductions. These have been executed by my own hand during the various travels I have made in different parts of Europe, and though all of them are published in my large work on this subject, this latter is not, I fear, accessible to all. It will be seen that out of this collection of some sixty examples, very few are English, and these belong to the seventeenth century. Most unfortunately, a really Mediæval organ does not remain in this country. A very early Renaissance example is to be seen at New Radnor, in Wales, and the Duke of Athole informs me that he possesses what is apparently one of the little portable organs with hand-bellows at the back, and which, though much altered in later times, may originally have been made so far back as the days of Henry VI; but with these exceptions, and a few others of doubtful character, we have nothing of earlier date than the time of Charles II.



Organ in Exeter Cathedral.



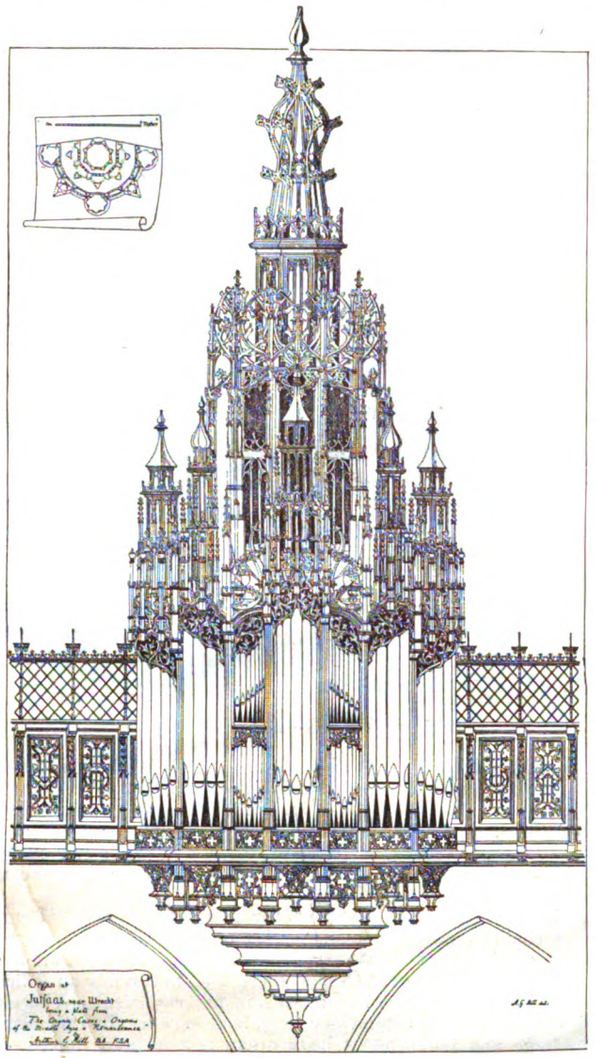
Organ in King's College, Cambridge, Eng.

It is tolerably certain that we never at any time possessed organs which could in any way compare with the magnificent instruments of the continent of Europe, and even we of this generation can almost remember the time when there was not really an efficient organ, judged by modern standards, in any cathedral or church in this country, so far behind our neighbors were we in this respect. The large and independent pedal-organ is a modern thing in this country, while at the beginning of this century the use of the pedal was unknown to English organists, and the compass of the keyboards varied absurdly. The first pipes of 32-feet pitch were made only some sixty years ago for York Minster, under the direction of my grandfather, and were considered marvels at the time, though now common enough even in England. But all these things were well-known generations before by the Continental organ-builders, and I shall draw your attention presently to more than one old foreign organ with 32-feet pipes made four centuries ago.

We should be glad enough, nevertheless, to possess some specimens of our English Mediæval instruments, however inferior in capacity, but the destruction and desecration of our churches during the great Rebellion was so terribly thorough that a clean sweep seems to have been made of these most interesting objects which gave such offence to the unreasoning fanatic of 1642. I will not here trouble you by quoting from old authors who describe the barbarous outrages of those times, because you can read such for yourselves in any good library, but a particularly interesting narrative relating to the destruction of the organ and other articles of church furniture in the English cathedral-churches is given by Dr. Bruno Kyres, dean of Windsor at the time, entitled "*Mercurius Rusticus, or the Country's Complaint of the Barbarous Outrages begun in the year* 1642, *by the Sectaries of this late Flourishing Kingdom*," and should be brought to your notice as especially relevant to our subject. This work accurately describes the demolition of the organs at Canterbury, Rochester, Exeter, Westminster and elsewhere. Thus at the Restoration of Charles II there were so few organs left in this country and the demand for new instruments was so great, that the celebrated Bernard Schmidt and Renatus Harris were invited to settle here and help to replace by fresh organs the many valuable examples which had fallen before the axe and hammer of the destroyer. It is not to be supposed, however, that every ancient organ here perished at the time, for we know that those in the cathedrals of Durham, York, Lincoln and St. Paul's; St. John's and Magdalen Colleges, Oxford; Christ's and King's Colleges, Cambridge, besides others in more obscure places, escaped the

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general demolition. Most of these, in their turn, disappeared in the tasteless days of the Georges, when archæology had little reverence for objects of this nature. As late as 1789 a small Mediæval organ existed at Tong, in Shropshire, as is evident by the description in the *Gentleman's Magazine* of that date. It also has now disappeared.



Organ at Jutfaas, near Utrecht, Holland.

It is thus evident why so few ancient organs remain in our own country.

In order now to point out to you the various peculiarities of ancient organs, as regards their antiquarian and architectural character, it will be better to take the examples of which we have drawings in their chronological order. The first point to be considered is the position of the organs in our churches. It was the universal custom of the organ-builders of the Restoration, and usually of the older Mediæval builders, to place the organ upon the choir-screen, or in a western or side-gallery. Nearly every cathedral in England, and many on the Continent had, at the beginning of this century, an organ upon the choir-screen, which gave great acoustical advantages to the instrument, and moreover, afforded an opportunity for the display of a fine case. But latterly there has been a craze for "vistas," and a notion prevails that a complete view should be obtained of the whole interior of a church from east to west, so that nothing of the end windows should be hidden. This is a most absurd and erroneous idea, and which is precisely contrary to the principles acted upon by the old architects, and particularly in England, where in a great number of important cases the choir-screen forms a very marked break in the interior view. At York, Exeter, Gloucester, Wells, King's College, Cambridge, and elsewhere, we find that organs thus arranged on the screen have a most excellent appearance, especially when the old cases remain. No old church-organ in the country is more picturesquely placed than at Exeter, where the fine seventeenth-century case harmonizes most delightfully with both its older and modern surroundings, although it has lost the company of its two exceedingly imposing and quite unique towers of pipes, which the late "restoration" swept away, and which till then stood at the two extremities of the screen against the tower-piers. The "vista" party in Westminster Abbey, also, prevented the placing of a small choir organ-case on the screen, which would have been a great feature in the church.

The destruction of screens has been even worse on the Continent, and has resulted in the ruin of many a grand church and the sweeping away of much magnificent work. At Münster, in Westphalia, I found the stone-screen of the fifteenth-century had been entirely demolished and broken up, and I hear that those at Bruges and Tournai are likewise threatened, with the sanction of that terrible product of modern times, the "restoring" architect.

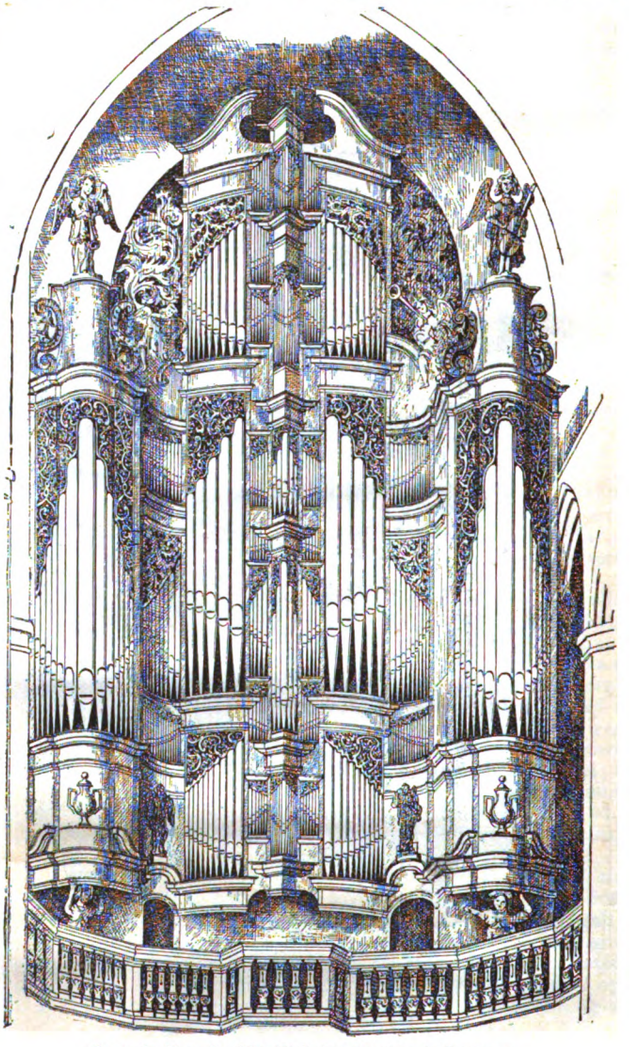
Not many years ago the choir at Norwich Cathedral used to sing from the screen, retaining till then the old usage. The French term "jubé" signifying the loft, is taken from the words of introduction to the service of Compline, "Jube, Domine benedicere."

Almost every organ, in old times, stood in a gallery of some kind, and not upon the floor of the church, as is now the general rule. This latter plan is, unfortunately the only resource in the majority of modern churches, but galleries or elevated sites are far better if they can be adapted to the building. The old galleries were placed either over the west door or at the extremity of one of the transepts; or, lastly, corbelled out in some peculiar manner from the triforium or other portion of the church above the main arcade. The west end arrangement, however, was by far the most common, and is still the usual situation in foreign churches, except in Spain, where the organs are almost invariably placed over the stalls, on one or both sides of the *coro*.

There are great advantages to be gained if the great organ can be placed in the western gallery, and a smaller one used for accompaniment in the choir.

Among the many interesting examples of west end organs — by which I mean those of fine architectural design — may be mentioned those at Sion, in the Valais; Amiens Cathedral; Hombleux, near Amiens; Jutfaas, near Utrecht; St. Bertrand de Commingos, in the Pyrenees; the magnificent organs in the five great churches at Lübeck; Augsburg, the two large churches; Constans cathedral church; Stralsund, on the Baltic; and St. Bavon, at Haarlem, all of which are illustrated.

The ancient lofts, minus their organs, remain at St. Stephen's,



Organ in Church of St. Nicholas, Stralsund, Germany.

Vienna; Ulm, Liège, the Carmelite church at Boppard, Ochsenfurth, St. Pantaleon at Cologne, and elsewhere. The so-called "minstrels'" gallery at Exeter, though not at the west end, is no doubt an ancient organ-gallery.

In the abbey church of Cornelismünster, near Aix-la-Chapelle, is

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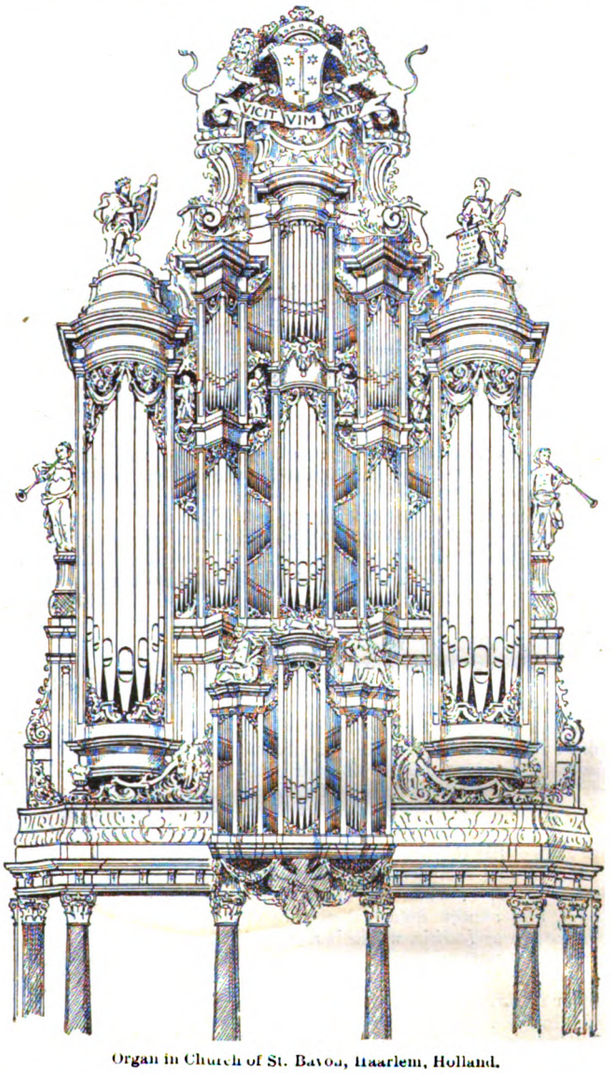
a most remarkable west-end organ-loft, furnished with stalls and every arrangement for a choir of singers, while there are other instances at St. Maximin, at Trèves, and the Abt Pfarrkirche, at Ratisbon, which I have examined. In Italy the organs invariably stand in galleries.

Amongst old organs placed in galleries placed elsewhere than at the west end, I may mention those at Chartres Cathedral; Freiburg, in Breisgau; La Forté Bernard, France; the Marienkirche, at Dortmund; and Strasburg Cathedral, all of which are bracketed out from above the nave arcade in a most charming manner. When this manner is adopted, a pendant gallery, or *cul-de-lampe*, is required, in which the organist sits, as in the splendid examples of Strasburg and Chartres. This latter organ is a structure 40 feet wide, spread out high above the pavement. The greater part of the work dates from 1512. Among modern organs that of Ely is similarly placed with charming effect; while the new organ at Peterborough Cathedral, for which I have myself designed the case, projects from the triforium above the stalls.

As mentioned before, the Spanish custom is to place the organs over the stalls, though there are exceptions to this rule, and I have pleasure to show you on the screen my drawings of the instruments in the cathedrals of Zaragoza and Tarragona, which are so placed, together with those at Barcelona and Salamanca, which are differently arranged. It may be taken that the earlier and smaller organs were usually in galleries.

The organs in Old St. Paul's and Westminster Abbey were placed over the stalls, as appears by Hollar's views. The two great instruments in Milan Cathedral are situated over the stalls, on either side, at the entrance to the choir. They are provided with folding shutters or doors, painted and decorated on the inner side, a very fine treatment to which we shall refer presently. At Ratisbon Cathedral is the curious instance of an organ placed behind the high altar.

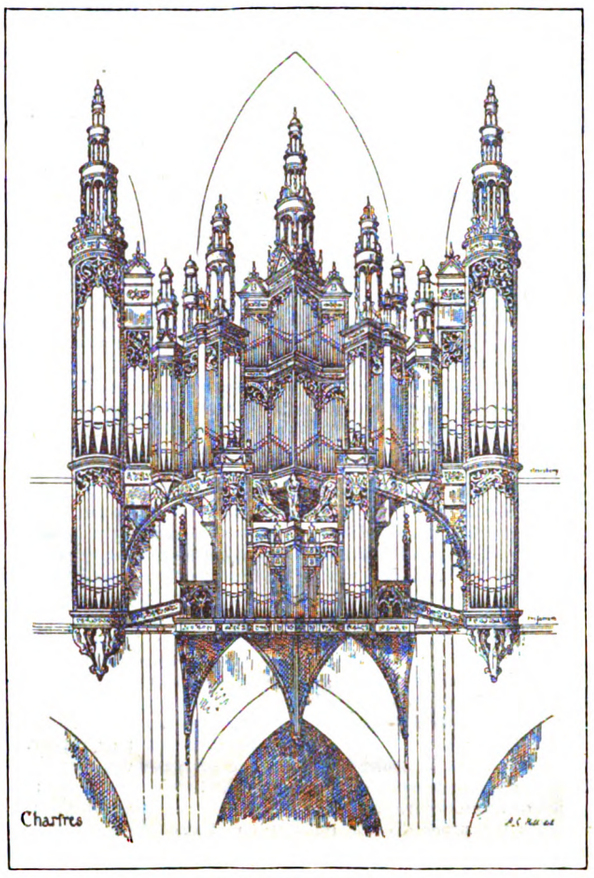
Having sufficiently discussed the ancient customs regarding the



Organ in Church of St. Bavon, Haarlem, Holland.

position of old organs, I need not trouble very much to condemn the modern "organ-chamber," a very unfortunate modern creation usually fatal to both the acoustic and architectural effect of the instrument; while many old churches have been greatly injured by the throwing out of these awkward excrescences.

We now come to speak of the organ case itself, which is a matter of large importance, I take it, to the present audience. The architectural woodwork which enclosed the organ was treated by the workmen of old times with a skill and vigor worthy of the instrument and of the artist himself, so much so, indeed, that the organ



Organ in Chartres Cathedral.

was frequently the most imposing and magnificent of all the fittings of the church in which it stood. The French call the case the *buffet d'orgue*, and the Germans *Orgel Gehäuse*. The examples which we have here depicted to-night will fully illustrate this branch of decorative art from the fourteenth century to recent times.

The two earliest organs I have discovered are those in the old cathedral at Salamanca, in Spain, and in the conventual church of St. Catherine at Sion, in Switzerland, both dating from the closing years of the fourteenth century, nor do I believe there are any other remaining examples of this period. These are both of comparatively small size, both stand in galleries and both have painted doors or shutters. As in all early specimens, the impost, or face line of the case, is straight and unbroken on plan by the towers and projections seen in later times. In addition to these two valuable examples we have the following organ-cases left to us, all of which belong to the Gothic style, and this list is, I believe, a fairly correct one of all that remains to us in Europe of work of this class, and has been compiled after much research in the churches of the Continent:

Salamanca, Cathedral Vieja	c. 1380	Strasburg Cathedral	1497
Sion, St. Catherine	c. 1390	Hombleux, Picardy	c. 1500
Zaragoza Cathedral	1413	Lübeck, Jacobikirche (second organ)	c. 1500
Zaragoza, San Pablo	c. 1420	Lübeck, Marienkirche (second organ)	c. 1500
Amiens Cathedral	1429	Jutfaas, near Utrecht	c. 1500
Palma, Majorca	c. 1430	La Forté Bernard, France	1501
Alcala de Henares, Spain	c. 1450	Lübeck, Marienkirche (great organ)	1504
Nordlingen, Bavaria	1466	Lübeck, Jacobikirche (great organ)	1504
Bologna, San Petronio	1470	Tirlemont, Belgium	c. 1505
Dortmund, Marienkirche	c. 1480	Chartres Cathedral	1513
Sekkau, Austria	1480		
Embrun, Dauphiné	c. 1480		
Perpignan, French Pyrenees	c. 1480		
Wissel, near Cleve	c. 1490		
Butzory, near Rostock	c. 1490		

I have records of other Gothic organs which have disappeared only within recent years, such as that formerly in the church of Rhenen, near Utrecht, of which I fortunately possess a drawing. There are also many prints extant showing fine organs in the churches of Nuremberg and elsewhere, which have now been demolished.

The organs at Lübeck are a special feature of that intensely interesting town. I know of no city in Europe (except perhaps in Spain) which is so little altered from its original condition, as created in the fifteenth century, as this delightful member of the old Hanse League. Here are six gigantic churches of brick, all save one possessing towers of enormous height, surmounted by spires of

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copper, green with the storms of four or five centuries. St. Mary's Church is the crowning glory of the Baltic style, built entirely of brick, with an internal height of 130 feet to the vaulting, and western spires each rising upwards of 400 feet. The great organ projects out at the west end, at a distance of 30 feet above the pavement, and, extending the whole width of the nave, rises to the vault of the church. The great size is most impressive, and the 32-feet pedal pipes of metal, which stand in the centre compartment of the case, seem comparatively small. The case is pure Gothic, of late German type, richly carved, painted and gilded. It was erected in 1504, but the interior is chiefly modern, the work of Schultze in 1853. The original inscription on the base of the great gallery runs

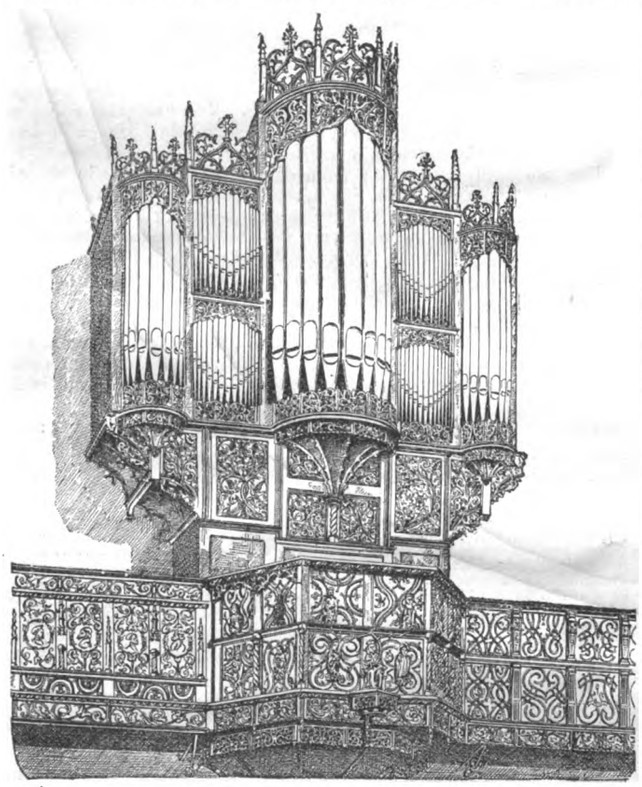
> Hoc opus renovatum anno Christi Salvatoris 1598, amplissimis clarissimisque viris D. Gothardo de Hovellen Consule et Georgio a Stiten Senatore Provisoribus hujus Ecclesiæ.

There are also inscriptions showing that the instrument was internally modified in the years 1640, 1706 and 1782.

These early Gothic cases are nearly always flat in part, that is, without projecting towers such as are found in later work, but with the pipes grouped in divisions of different altitudes only. At first the woodwork was confined almost exclusively to the portion of the organ below the pipes, the latter being supported merely by a band of wood, as in the small portatives generally seen in representations of St. Cecilia, as in the triptych by Van Eyck, painted for the cathedral at Ghent, the wings of which are now at Berlin.

When organs become much larger in size, as they did later in the fifteenth century, this simple arrangement of the pipes was abandoned, and a far greater elaboration introduced into the design.

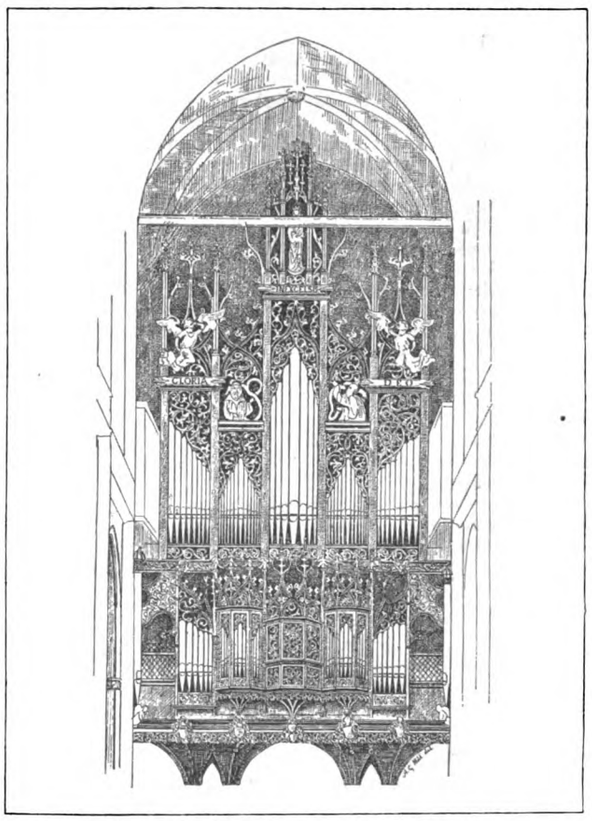
A very important feature in the design of all old organs is the carved woodwork, behind which the upper extremities of the pipes are hidden. These enriched shades are never absent in old organ-cases, and you must have observed them often enough at Exeter, Gloucester, Cambridge, Hampton Court, or in many of the city churches. These mediæval features have thus been preserved through the later Renaissance times until the death of traditional architecture in this country about a century ago. In the Lübeck organs the shades follow, at their lower edges, the natural rake of the pipe tops, which they are designed to conceal; or rather, these shades should be considered as a piece of ornament introduced to fill up the irregular space left between the tops of the pipes and the cornice or architectural woodwork of the case above. In the earliest examples the pipes do not quite touch these shades, but leave a small space between, with very picturesque effect, as in the organs



Organ in the Marien Kirche, Dortmund, Germany.

at Sion and Salamanca, and also in the grand later cases at Tarragona, and at the Carignano Church at Genoa. It will be seen that in not a single ancient organ of any size do the pipes themselves form the outline of the case, and this rule is, unfortunately, entirely set at nought by modern designers. The effect of rows of pipes without woodwork of any kind surmounting their upper extremities is exceedingly bad, and is the chief defect in modern organs.

There are three other Gothic organs at Lübeck, all of which I have drawn, and there is probably not another town in Europe which possesses four instruments of this early date, and few which



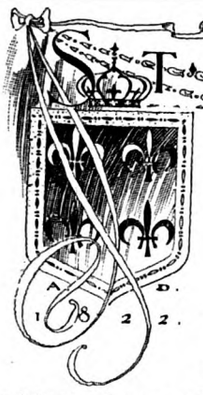
Organ in the Marien Kirche, Lubeck, Germany.

possess even one. The Churches of St. Mary and St. James each contain two organs, one at the west end and one in the aisle. These latter stand in galleries with receding sides and vaulted supports, and are admirably spirited compositions, well worthy of modern adaptation. These twisted pinnacles and great crockets are distinctive features of late German Gothic. These four Lübeck organs are important illustrations of what the best church instruments in Germany were like at the beginning of the sixteenth century. We have nothing in England of this date, and it is probable that we never at any time had works at all comparable with these in size and beauty, and they far surpass, even when regarded from the player's point-of-view, any organ erected in our country before this century was well advanced. You will notice one constant factor in the design of these instruments; the upper portion of the case invariably overhangs the base. This is due to the fact that the bellows and action occupy less space than the soundboards above, producing an element in the design which is highly satisfactory, and which is, in fact, almost a necessity of the composition. The great failure of modern attempts in the designing of organ-cases is the non-recognition of this important principle, which was carefully preserved in England by Father Smith and other builders of the Restoration, as you can see if you examine cases of this date.

In making this digression concerning Lübeck and its art furniture, I must call attention to the very magnificent organ in the Ogidien-kirche, where it stands at the west end. This work dates from as late as 1675 and is most sumptuous in both design and execution, and altogether one of the finest I have seen. It is of oak, without colored decoration, but magnificently carved and enriched. You will notice that there is in the design a complete organ of itself, consisting of one semicircular and two pointed towers or projecting groups of pipes, while the central composition is flanked by two larger and almost detached towers of 16-foot pipes. There is a choir-organ or *Positir*, which is a reproduction on a smaller scale of the main organ overhead. The gallery is a canted soffit, wonderfully elaborated. Though dating from 1675, this case is fully eighty years earlier in style than would be the case with a work of similar character in the south of Europe, when the new style or Italian Renascent school came earlier into vogue. While all the details of this case are Classic, yet the forms are strictly Gothic and all the true mediæval principles are maintained throughout. The turret-like erections on the summits of the towers are Gothic canopies Classically treated. It may, in fact, be said with regard to Renaissance architecture, that when all the Gothic spirit in it had died out the style lost all its artistic excellence.

(To be continued.)

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THE UNION PASSENGER STATION. — VALUATION OF REAL AND PERSONAL PROPERTY. — PROPOSED NEW BOULEVARDS. — NEW EXHIBITS AT THE MUSEUM OF FINE ARTS. — THE POLLUTED WATER-SUPPLY. — NEW WATER-WORKS.

NOTWITHSTANDING the depressed condition of finance and trade throughout the country at the present time, St. Louis presents activity so far as matters architectural are concerned. There seems to be no cessation in the erection of new buildings, and the promotion of public improvements. A noticeable change, however, from the recent order of affairs, consists in the fact that comparatively few residences are being put up, in comparison with a year ago, while the number of flats and buildings of a public or semi-public nature is unusually large. Chief among these is the new Union Passenger Station, of which we have previously made mention in these columns and which is to cost, when completed, in the neighborhood of $5,000.000. This imposing edifice, that is to say, the head-building, is fast nearing completion and the nearer the time for the finishing touches approaches, the more its great size grows upon one. In itself, it is not an extraordinarily large structure, but is above the average size of railway stations. There are evidences throughout that no money has been spared to make this the finest and largest railway-station in the world. We think the Terminal Association has been successful in both these points. The writer, in making such an assertion, does not speak at random, because he has been fortunate enough to see all the finest and largest stations in both this country and in Europe. So far as size is concerned, the only station in the world that approaches the St. Louis structure is located at Frankfort, Germany, and this is little more than three-fourths the size of the former; St. Pancras Station, London, is the only one that can claim the distinction of being its peer as far as architecture is concerned. The German station is an architectural monstrosity consisting of three train-sheds, side by side, with a sort of semi-façade of cut-and-dried designs in architectural iron-work. It possesses no originality of design whatever. In the St. Louis station the head-building is the attractive feature, the train-shed being noted for nothing except that it covers thirty-two tracks in one span. The building is French Renaissance, a notable feature being the employment of the round arch to a great extent. The whole is built of Bedford stone, which gives it an unmistakable air of stability. Needless to say, the entire structure is fireproof, and the interior furnishings, which are now being installed, are the best that money can buy. Looking into the main waiting-room at an elevated position are to be three of, what are said to be, the largest stained-glass windows in the United States, representing allegorical figures of St. Louis, New York and San Francisco, St. Louis, of course, being in the centre. The Terminal Association was recently summoned before the mayor to make an explanation in regard to a *porte cochère* which is being built on the Eighteenth-Street side of the station, and occupying a portion of the sidewalk without permit. Fortunately for the east façade of the building, the matter was satisfactorily settled and the *porte cochère* will remain. The Terminal officers have several times endeavored to "bluff" the City and in one case threatened to stop work on the station if hampered in their work. At all times, however, matters have been settled to the satisfaction of both parties. The City has been very lenient with the Association, and we say this with some regret, for, station or no station, the City should not be dictated to and its laws and ordinances put to naught by railroad companies or any other corporation whatever.

Mr. A. H. Frederick, president of the State Board of Assessors, recently submitted an abstract of real and personal property in the city of St. Louis, which shows the following: —

Old Limits. — Lands, 1049.6 acres, valued at $2,046,450; town lots 70,162, valued at $204,514,920; personal property, $39,743.250. Total, $246,304,620.

New Limits. — Lands, 10,281.96 acres, valued at $5,562,940; town lots, 41,594. valued at $47,656,790; personal property, $4,594,860. Total, $57,817,590.

Old and New Limits. — Real and personal property, $304,122,210.

The assessed value of real and personal property is 55 per cent of the actual value, which is, in round numbers, $600,000,000. The tax rate is $1.40.

There has been a great deal of agitation recently concerning the general improvement of the down-town streets. Several meetings of prominent business men and citizens generally have been held at the Mercantile Club, looking toward the inauguration of a system of business boulevards. We think St. Louis is taking the initiative in such a scheme, so far as the United States are concerned. Of course, the idea is borrowed from the world-renowned boulevards of Paris. It is an urgent necessity that many of these streets be widened, that others be continued through property which cuts them off abruptly, and that suitable street-paving material be substituted for the noisy granite which is now the rule. There are great opportunities for improving Twelfth Street on an extensive scale. This thoroughfare, as we remarked sometime ago, is fast becoming the centre of the best retail trade of St. Louis. Plans have been submitted by various architects for its improvement, one of which was illustrated in the *American Architect* sometime ago. Mr. Julius Pitzmann, one of St. Louis' foremost civil engineers, recently submitted a plan to the Society of Architects for changing certain streets to boulevards, at a cost to the city of $2,000,000. His idea is to continue Twelfth Street, which is 150 feet wide between Washington Avenue and Market Street, northwardly in the same width to Cass Avenue and southwardly to Park Avenue, then westwardly to Lafayette Park and Jefferson Avenue, which is 120 feet wide; then by another ordinance establish a boulevard on Market Street from Twelfth Street to Jefferson Avenue by condemning the lots on the north side of Market Street extending to the alley, making a new boulevard 148 feet wide. The latter improvement would add greatly to the appearance of the new Union Station, which is now shut off from view by the buildings opposite, on Market Street, a very narrow thoroughfare at this point. This much being done, the foundation for the system could be considered well under way. The new city-hall with its public square around it, the Four Courts, and a fine viaduct over the railroad-tracks with abutments in the form of triumphal arches, would furnish interesting features and would make Twelfth Street for years to come the most available location for theatres, hotels and fine stores, not to mention the most coveted promenade in the city. It is also proposed to connect what is to be Market Street Boulevard with the famous Lindell Boulevard to Forest Park. Such a system of magnificient thoroughfares would undoubtedly prove a most valuable acquisition, and one for which the people would be willing to pay. But radical changes would have to be made, such as "boulevardizing," if we may use the term, more prominent thoroughfares than those above-mentioned, and which are the natural arteries of travel. It is evident the committee refrains from doing this on account of the enormous cost of taking the necessary property for widening the important streets. If unimportant streets are made boulevards, the very purpose of the scheme is defeated.

The St. Louis Museum of Fine Arts now has on exhibition in its galleries a collection of sculpture, paintings, book-bindings, and other works of art recently acquired by it. These include its acquisitions at the World's Columbian Exposition. The bronzes are of exceptional interest, being exact reproductions of the originals found in Herculaneum and Pompeii, and now reposing in the National Museum at Naples. They not only include statuary, but household utensils and various articles found in the ruins of these two buried cities. There are splendid reproductions of the "Drunken Faun," "Cupid with Goose," and "Winged Victory." The examples of bronze and silver plate, bowls and cups, are both unique and interesting, all possessing the originality and grace for which the Romans were noted. The collection of book-bindings is from the Danish Section of the Columbian Exposition. There are many curious designs cut into the gilt edges of the books, which have attracted a great deal of attention. The stamped-leather bindings and general ornamentation of same in gilt and colors are very fine. Among the recent paintings acquired by the Museum may be mentioned "A Dash for Timber" by Frederick Remington, and "The Temptation of St. Anthony" by Teniers; also "Mending the Canoe" by Douglas Volk, "Another Marguerite" by Joaquin Sorolla, and a number of others which were on exhibition in the Art Gallery at the World's Fair. There are some famous pictures recently acquired for the loan collection, among them two Verestchagins and a Rembrandt. There is a plaster cast, by Jean Goujon, of Louis de Brézé in a recumbent position, being a copy of the monument in Rouen Cathedral executed during the latter half of the sixteenth century. Some valuable additions to the collection of porcelains in the Museum have recently been made by a number of its benefactors, there being some very fine examples of old Wedgwood and Royal Worcester. The loan collection of porcelains has recently received several valuable additions, among which special mention should be made of the Japanese, Chinese, and Corean porcelains and jades. The latter is a portion of a very fine collection owned by Mr. Chauvenet of St. Louis.

We spoke in a recent letter in regard to the threatened pollution of the St. Louis water-supply by the Chicago drainage-canal. Like many other short-comings of our present Mayor and Municipal Assembly, the wholesale water sampling recently carried on under the supervision of the City Chemist has come to an end through their means, and the matter has dropped entirely out of sight. Because of this there is nothing else for the people of St. Louis to do, but to sit by and drink dirty water, — all the result of the inefficiency and slumbering attitude of the city administration. If the water simply contained pure clay or earths, they could easily be disposed of in the settling-basins (then, besides, these are not considered unhealthy), but it has been shown to contain albuminoids, nitrites, and nitrates in great quantities which have no other source than Chicago pork-packing establishments and slaughter-houses. Matters have stood thus during the life of the Illinois and Michigan Canal, so how aggravated they will be when the Chicago Canal is completed may readily be appreciated. The new waterworks at the Chain of Rocks on the Mississippi River are the occasion for our remarks and all the fruitless investigations that have been made.

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They represent an outlay of over $6,000,000 taken directly from the pockets of the citizens of St. Louis, no bonds having been floated for the purpose of building the plant.

The Chain of Rocks is located at the extreme northern limits of the city, only about four miles below the mouth of the Missouri River, which flows into the Mississippi at this point. The location is an admirable one, being a point projecting into a deep part of the river, thus insuring a supply at all times. Opposite the point in the middle of the river channel is the inlet tower, built of granite for the base above high-water mark and for the remainder of the distance, one story, of limestone. The roof is covered with red Italian tiles. The water is conducted from the tower under the bed of the river to the settling-basins by means of the pumps. The basins are six in number and each covers a little over six acres, or an aggregate area of about thirty-seven acres. The stonework on these is about as fine an example of the stonemason's art as can be seen. The walls are extraordinarily heavy, even for the purpose, and are built of huge freestone blocks put together with great neatness and finish. They are capped with smooth-finished limestone blocks. The bottoms are laid with granitoid divided into squares and the whole pitching towards the centre, so as to facilitate flushing the basins when such an operation is necessary. At the intersections of the basins are placed the gate-houses, which are substantial little buildings of red granite and St. Louis press-brick. The pumping-station, boiler-house, coal-houses, etc., are very neat buildings for the purpose, and the materials used in their construction are red granite and press-brick as in the gate-houses. The pumps are of the latest vertical type, and their size may be appreciated by the fact that they extend about 100 feet below ground. The full capacity of the plant is 160,000,000 gallons every twenty-four hours, but the pumps now being installed will give only 100,000,000 gallons. Two are of 30,000,000 gallons capacity and were built by the E. P. Allis Company of Milwaukee, Wis., while the remaining 40,000,000 are divided into two units of 20,000,000 gallons each, supplied by Henry Worthington of New York, N. Y. The contract for the water-tube boilers was awarded to the National Water-tube Boiler Company of New Brunswick, N. J., after much discussion, it being the desire of the Commission to give the contract to a local water-tube boiler company. A conduit twelve feet in diameter extends from the works to the distributing plant at Bissel's Point, six miles below, and much further in the city. After settling at Chain of Rocks, the water flows by gravitation to Bissel's Point, the conduit being at a slight incline. Here it is again settled in basins, then pumped to the two water-towers, which create the pressure, and distributed over the entire city. The distributing plant is no longer equal to the demands put upon it, on account of there being no more room in the adjacent streets for an increase of pipes necessary to give a satisfactory supply to the northwestern part of the city, which has grown so rapidly during the past few years. To remedy this defect, No. 3 plant will very shortly be erected at Baden, halfway between plants 1 and 2, with the necessary pumps, settling-basins, water-tower, etc. The estimated cost of No. 3 plant will be only in the neighborhood of $500,000.



THE ENGINEERS' CLUB OF PHILADELPHIA.

AT the regular meeting, held April 21, 1894, President John C. Trautwine, Jr., in the chair, seventy-eight members and visitors were present.

A paper on "The First United States Pneumatic Postal System" was presented by the author, Mr. A. Falkenau, who stated that the year of trial of the first pneumatic system for postal service in the United States had just been completed and the extension of the system for commercial, as well as postal, service was contemplated. Before describing the Philadelphia system a brief review was given of what had been done in Europe in the way of pneumatic transmission, and the London and Paris systems were more particularly described as follows: In London the tubes were 2½ and 3 inches lead pipes laid in cast-iron pipes for protection. The carriers used in 2½ tubes were but 1¼ inches diameter, the remaining space being taken up by packing. Carriers are despatched singly. First, vacuum alone was used; later, vacuum and compressed air. The tubes used in the continental cities in Europe were wrought-iron, the Paris tubes being 2½ inches diameter. There the carriers are despatched in trains of 6 to 10, propelled by a piston. The carriers and tubes were more fully described, also the method of locating obstructions in the tubes.

The two methods of laying pipes on the radial and polygonal systems were fully described. To give an idea of the extent to which this work is carried in Europe, it was stated that the London system has 42 stations with a total length of 34 miles of tubes. Six engines of an aggregate of 216 horse-power constitute the power plant. The Liverpool and Berlin systems were similarly described.

In 1892 the Pneumatic Transit Company of New Jersey contracted to install the Philadelphia plant. As the size of tube adopted and laid was 6⅜ inches diameter, entirely new problems presented themselves. The velocities adopted in all systems is about the same, being 30 miles per hour. The stored energy of a London carrier while at full velocity is only nine foot-pounds, while that of the Philadelphia carriers has been as high as 1,380 foot-pounds. The problems of dealing with this energy were thoroughly solved by Mr. B. C. Batcheller, the engineer of the company. Air-cushions were introduced, the accumulated pressure in the cushion chamber being utilized at the same time to operate automatically the receiving apparatus. The distance from the main post-office to the sub-station of Chestnut Street is 2,928 feet. There being an outgoing and return tube, the total length is 5,856 feet. The apparatus at the two stations was described in detail. The pressure of air at the main post-office is seven pounds, while at the sub-station it is about four pounds, as the pressure does not fall at a uniform rate. The air passes through the entire system of tubes, returning to the post-office at atmospheric pressure, the end of the tube being practically open to the air. The two air-cylinders of the compressor located at the main post-office are 18-inch bore, while the steam-cylinders are 10-inch bore with a piston-stroke of 24 inches.

There has not been a single case of obstruction of the tubes since the plant was first put into operation.

The difficulties encountered in laying the pipes and boring the same were described. The use of air-blast in boring reduced the temperature near the cutters from 20° to 60° Fahrenheit.

Attention was called to the fact that, mechanically, pneumatic propulsion is not economical, about 90 per cent of the work being wasted. It was pointed out, however, that commercially the value of pneumatic transmission was amply proven and that the larger size of pipe adopted here would permit a more remunerative class of business to be done.

It is now proposed to extend the system to cover the greater part of the city, locating the central pumping-station about Twelfth and Market Streets, with other central stations at Columbia Avenue, South Street, etc., the connections being made on the radial system. Each central station will be the nucleus of a number of local polygonal circuits, covering territory within convenient limits. Views illustrating the Philadelphia and also the European plants were shown.

In closing, Mr. Falkenau stated that this first pneumatic postal tube in the United States was the largest of its kind in the world, and presented the Club with sections of the tube, thinking they might be of historical value.

DISCUSSION.

Mr. W. W. Carr, Postmaster of Philadelphia, stated that the tube had been placed in the hands of the Government before his appointment, and that much of the credit for its installation was due to the indefatigable energy and persistency of his predecessor, Mr. John Field.

The subject is one of great interest, not only to engineers, but also to the general public, on account of the direct return received through the increased efficiency of the mail service.

The tube has carried 30,000 letters per day, and has been working most satisfactorily and without a single stoppage. Great credit is due Philadelphia for introducing the first pneumatic system in the United States. Chicago and other cities are contemplating following our example.

Mr. John Field explained that he felt the need for improvement in the methods of handling the Philadelphia mails as soon as he entered upon his duties as postmaster. He visited European cities to learn the best methods in vogue, and decided to recommend the adoption of a system similar to that in use in Berlin. More or less meritorious designs were offered by different companies, but the greatest difficulty was to obtain the permission of the Government to make the trial. The system finally adopted has proved entirely successful and reflects great credit upon its constructors, as well as its designers.

Mr. B. C. Batcheller said that the most economical speed of carrier was about 30 miles per hour, and the actual time the mail was in the tube was but a very small part of the total time in handling. An increase in velocity would add to the wear and tear, with but little gain. This same speed is used in the Continental lines.

The diameter of the tube was determined only after mature deliberation. The original intention was to use 6-inch wrought-iron pipe; but finding the diameters varied too much, 6-inch cast-iron water-pipe was used, bored out to 6⅜ inches. This capacity has proved ample, and is by far the largest in the world. Each carrier holds about 200 letters, but 100 to 150 should be taken as the average, which, at the rate of 8 carriers per minute, gives a delivery of 48,000 letters per hour. The time required to make the distance between the two post-offices is about 57 seconds, and the carriers will run about 550 miles before the packing-rings placed on the outside to form air-tight joints will wear out. This packing was formerly made of felt, but it is now found that canvas answers the purpose very well.

The best form of carriers are those with open ends, as this gives a much stronger shape than those with the openings on the side, and there is much less danger of breakage. The largest size of pneumatic tube considered feasible was about 8 or 10 inches in diameter, as beyond this size the carriers increase so rapidly in weight that the packings, upon which the whole weight rests, would soon wear out. The length of such a line should not exceed 4 miles.

Mr. Batcheller closed with some interesting conclusions drawn

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from his experience regarding the advantages and applicability of the polygonal system, giving special reference to the enlargement of the Philadelphia plant. STRICKLAND L. KNEASS,
Secretary, pro tem.

THE SKETCH-CLUB OF NEW YORK.

THE regular monthly meeting and dinner was held at the club-rooms Saturday evening, May 5, thirty-one members and four guests being present. President Edgar A. Josselyn occupied the chair. Mr. D. H. Haigh, the guest of the Club, gave a very interesting address on the chemical properties of plaster, the manufacture of lime and plaster-of-Paris. After this, ex-President Julius A. Harder read a paper on designing, giving some very practical views on this subject, which was highly appreciated by the members.

In response to a request from the American Institute of Architects for suggestions as to rules governing competitions, the following resolutions, referring to such points only as directly affect our (draughtsmens') interests, were adopted:

Whereas, Competitions being the principal medium through which the younger and unknown men may gain recognition, be it, therefore,

Resolved, 1st, That we believe that all competitions should be *open* except when paid competitors are selected by means of an open *preliminary* competition, similar to that of the Brooklyn Institute.

2d, That competitive drawings should be of the simplest character possible.

The meeting adjourned at 11.15.

H. C. PITTMAN, *Recording Secretary.*

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

HOUSE ON CAMP ST., NEW ORLEANS, LA. MR. JAMES FRERET, ARCHITECT, NEW ORLEANS, LA.

[Gelatine Print issued with the International and Imperial Editions only.]

THIS house, No. 927 Camp St., New Orleans, was originally built in 1869 for the then Superintendent of the New Orleans Gas Light Co., and to meet his ideas of utilizing gas products, the roof was made of tar and gravel and the porch (gallery) columns of four-inch gas-pipes, which have since been changed to Doric. The house has now been remodelled, adding the octagons and conservatories and both exterior and interior changed from perfect plainness to its present appearance.

The walls and ceilings of the hall, dining-room and library, above the solid walnut wainscoting, are veneered in oak and two kinds of walnut with the Chas. W. Spurr veneers.

TOWN-HALL, FAIRHAVEN, MASS. MR. CHARLES BRIGHAM, ARCHITECT, BOSTON, MASS.

THIS building was given to the town by Mrs. H. H. Rogers.

HOUSE AND STABLE FOR JOHN A. LYNCH, ESQ., CHICAGO, ILL. MESSRS. JENNEY & MUNDIE, ARCHITECTS, CHICAGO, ILL.

THE exterior is entirely of smooth dressed white granite from Maine quarries. The roof is of glazed Spanish tile. The interior is finished in polished woods, marble, mosaic and metal-work. The total cost will be nearly $100,000.00.

DINING-ROOM IN SAME.

HOUSE OF JOHN I. GLOVER, ARCHITECT, BALDWINS, L. I., N. Y.

INTERIOR VIEWS OF THE FOLLOWING CHURCHES, SHOWING THE ORGANS: EXETER CATHEDRAL, EXETER, ENG.; LINCOLN CATHEDRAL, LINCOLN, ENG.; RIPON MINSTER, RIPON, ENG.; ABBEY CHURCH OF ST. DENIS, ST. DENIS, FRANCE; NOTRE DAME DE BON SECOURS, ROUEN, FRANCE; AMIENS CATHEDRAL, AMIENS, FRANCE.

SEE article on "Church Organs" in this issue.

[Additional Illustrations in the International Edition.]

THE NORWEGIAN GOVERNMENT BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. W. HAUSTEEN, ARCHITECT.

[Gelatine Print.]

HALL IN HOUSE ON CAMP STREET, NEW ORLEANS, LA. MR. JAMES FRERET, ARCHITECT, NEW ORLEANS, LA.

[Gelatine Print.]

BRONZE DOORS, ADELPHI BANK, LIVERPOOL, ENG. MR. W. D. CARÖE, ARCHITECT.

BATHS AND LIBRARY, GREAT SMITH STREET, WESTMINSTER, LONDON, ENG. MR. F. J. SMITH, ARCHITECT.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

ARCHITECTURAL DESIGNS FOR THE MECHANICS ARTS HIGH SCHOOL.

BOSTON, MASS., April 27, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — The idea has come to me that it would be a fine scheme to hang the walls of the "Boston Mechanics Arts High School" with architectural designs and details; thus not only affording the scholars good examples of existing work, but also directing their taste in the right direction.

There are always on file in the architect's office many designs and details which have practically outlived their usefulness, but which would be valuable in a collection such as I desire to make and for the purpose intended, and I earnestly ask my brother architects to contribute to this object. It seems to me desirable, as far as possible, that the drawings so contributed represent a given building, by plans, elevations and details; so that the design and use of the details may be intelligently understood by the scholar. Contributions will be properly classified, and hung in groups, with the name of contributor attached. It is to be understood that contributions are to be held as *gifts* to the City of Boston, to be *placed* and to *remain* in the "Mechanics Arts High School."

The scheme has been submitted to the School Committee and meets with its hearty approval and coöperation.

It is desired that all contributions be delivered at my office, on or before Saturday, May 19.

Trusting that the scheme will enlist your generous support, I remain, Yours truly, JOHN LYMAN FAXON.

THERMOSTATS.

NEW YORK, N. Y., May 4, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Can you inform me as to whether or not there is any form of thermostat now on the market which will operate the valve between the hot and cold air supply so as to mingle the two, to give the desired degree of temperature.

What I desire is one that will partially open the valve and not only operate the valve through two positions, one open and the other shut. Yours truly, GEO. HILL.

EXHIBITIONS

BOSTON, MASS. — *Several hundred Specimens of Textile Designs of all countries, from the second century to the present time, from the collection given by Denman W. Ross; also a collection of Japanese Color-prints:* at the Museum of Fine Arts.

Architectural Drawings by Albert Randolph Ross: at the St. Botolph Club, May 7 to May 19.

CHICAGO, ILL. — *Seventh Annual Exhibition of the Chicago Architectural Sketch Club:* at the Art Institute, opened May 10.

NEW YORK, N. Y. — *Sixty-ninth Annual Exhibition, National Academy of Design:* 23d Street and Fourth Avenue, April 2 to May 12.

ST. LOUIS, MO. — *Exhibition of Architectural Drawings by St. Louis Chapter, A. I. A.:* at the Museum of Fine Arts, April 27 to May 13.

NOTES AND CLIPPINGS

THE LARGEST BALLOON IN THE WORLD. — There has recently been built by Messrs. Charles Green Spencer & Sons, of Holloway, a balloon of larger capacity than any hitherto existing. Its capacity is over 100,000 cubic feet, and it will lift a ton, in addition to its own weight of 1 1-4 tons. It is a sphere with a diameter of 57.24 feet, and is inclosed by 120 gores of silk, each 18 inches wide, sewn together by four miles of stitching One object in building the balloon has been to enable continuous observations to be made over six days without descending, and to enable this to be done the bag is a double envelope of silk with a layer of varnish between, and uniting, the two skins. The cost of construction has been 2,500*l*. To enable the gas to be

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quickly liberated after the balloon has been anchored by its grapnel there is a 4-foot valve at the top. This valve consists of two semi-circular flaps, each hinged along the straight side, and held up to the face by twelve helical steel springs, three-eighths inch in diameter and of 16 B. W. G. wire. The flaps are strengthened by light brass frames on their upper sides, and battens on their lower sides. The frame of the valve is a bent ring of ash, with two wood battens. It is placed in a hole prepared for it in the top of the balloon bag, and is held to the silk by an encircling metal band. The valve is opened by a line passing through the centre of the balloon into the car, and is closed by the springs. There is a drip cloth round the balloon about one-fourth the way up, to divert any rain that may be collected on the surface from falling on the passengers. A ladder affords communication from the car to the zenith of the sphere. The balloon made its maiden trip from the Crystal Palace grounds on Wednesday, February 21, and after remaining up for four and one-half hours in a comparative calm, descended at Horsham. It is proposed to undertake several scientific trips, after which it will be worked as a captive balloon at the grounds of Woodhouse Park, Uxbridge Road, during the summer season from May to October. — *Engineering.*

HOW A PRIEST SAVED A GOLD ALTAR. — The gold on the Paliotto executed for that very interesting church in Milan, St. Ambrogio, by the goldsmith, Wolvinus, was valued at 280,000 gold crowns: it is a most beautiful piece of goldsmiths' work, enriched with cameii and intaglii, precious stones and enamel. Quintilian justly observes, "*Ars summa materia optima melior*," and the value of the exquisite design and arrangement of this work is far above the value of the material employed, yet the value is, in this case, so far above price, that there is an additional reason for being glad it is still preserved to us. Count Balzani told me how nearly it was lost when Milan was entered by the famished soldiers of Napoleon, and how it was saved by the adroitness of a priest, who knew that a small portion had either been stolen or lost, and that the vacant space had been supplied with a good imitation in copper gilt. This little accident was only known to a few of the priests, the outer world knowing nothing of it. When the soldiers entered the church the priest advanced to them, asking what they wanted. He was rudely answered, "the gold altar case and the gems set in it." "Alas!" he said, "would that we had a gold altar, its value would supply the wants of many; it is this gilt Paliotto," he continued, "that you must mean. Look! I will show you the gold." And he coolly broke away the restored copper-gilt portion, saying, "Do you think, if the gems ever were real, those here now are better than the copper? No, poor fellows, it is not in this bare, half-empty, poor old church that you will find treasure; go, seek it elsewhere." And they went without touching the Paliotto. — *From a Lecture by Mrs. Newman before the Society of Arts.*

CHICAGO BUILDING THAT STOPPED CLOCKS. — A local corporation, recently organized, established its headquarters on the top floor of one of the tallest buildings in town. The attorney had a room to himself; the secretary was given another palatial apartment; the superintendent reigned supreme in another place; the president was, of course, compelled to outdo all the others in leather-cushioned chairs, massive tables and expensive bronzes. The crowning glory of his private office was a big clock with an elaborately-carved case. It was the best clock in the entire stock of a local dealer, and it had a long, shiny pendulum, which was to swing slowly and with regularity, as became a clock owned by the president of such a solid and respectable corporation. On the first day the pendulum stopped. The clock was sent back to the dealer, whose experts took it apart, oiled it and set it to running again. Once more it was taken up to the president's office and once more it ceased running. For a second time the experts dissected it and found every part in working order. It kept time to the second for two days and was confidently returned to the buyer, who reported back again in two hours: "The clock has stopped." An architect who became acquainted with the facts in the case solved the mystery. He said the oscillation of the high building counteracted and stopped the swing of the pendulum. The pendulum couldn't work with any regularity, so long as the building was nodding around in the changing winds like a cat-tail before a summer zephyr. "So the tall buildings do swing back and forth?" he was asked. "Certainly, but don't be afraid: they'll not break."— *Chicago Record.*

AN ARTIFICIAL PAVEMENT USED IN MUNICH. — Since the ideal pavement is not yet generally found in New York streets, it may be of interest to observe that they are getting on particularly well in Munich with one made of artificial stone. The basic material is serpentine, crushed or ground into meal. A fluid, the composition of which is a secret, is added, and the mixture is pressed into moulds with hydraulic power, forming bricks about the size and shape of the granite blocks used here. These bricks are dark brown, very hard, but curiously elastic. The blow of a hammer, if strong enough, will make an impression upon one, but, though close to the edge, will not split or splinter it. Attrition has no more effect upon this pavement than upon granite, and when worn smooth, it is never slippery, it is scarcely more noisy than asphalt, and yields no dust: indeed, according to the proud Munichers, it is just about perfect. Whether it would be so satisfactory here, where it would probably be carelessly laid, and certainly would be torn up for pipe-laying three or four times a year, is a problem. — *N. Y. Tribune.*

THE LION BRIDGE, NEAR SANGANG, CHINA. — The longest bridge in the world is the Lion Bridge, near Sangang, in China. It extends five and one-fourth miles over an arm of the Yellow Sea, and is supported by 300 huge stone arches. The roadway is 70 feet above the water, and is inclosed in an iron network. A marble lion, 21 feet long, rests on the crown of every pillar. The bridge was built at the command of the Emperor Kieng Long, who abdicated in 1796, on account of old age. — *Philadelphia Record.*

THE WORLD'S TUNNELS. — The tunnels of the world are estimated to number about 1,142, with a total length of 514 miles. There are about 1,000 railroad tunnels, 12 subaqueous tunnels, 90 canal tunnels and 40 conduit tunnels, with aggregate lengths of about 350 miles, 9 miles, 70 miles and 85 miles, respectively. — *Invention.*

LONG CLOCK PENDULUMS. — No clock in England has, it is stated, so long a pendulum as St. Chad's Church clock at Shrewsbury, which was made last century. The pendulum of this clock is 22 feet long, and the ball 4 feet 3 inches in circumference and 200 pounds in weight. "Big Ben" in the Westminster Hall Clock Tower has a pendulum 15 feet in length, the dial is 71 feet in circumference and the minute-hand, which is 11 feet 6 inches long, is hollow, made of copper, and weighs 1¾ cwt. The figures on the face of the clock are over 2 feet in length and the minute dots exactly 1 foot 1 inch apart from centre to centre. The clock reports its own time at Greenwich and is so accurate that it does not vary more than four seconds in the year. The longest pendulum ever made is said to be that used at the Eiffel Tower in Paris, the length of which is 377 feet. — *Invention.*

DOULTON'S SOIL-PIPE JOINT. — The joint between the leaden soil-pipe and the stoneware of a closet has long been a *bête noire* to sanitary engineers. The usual practice is to use red lead to render the joint gas-tight, but such a joint can never be depended upon in the same way that a soldered joint can be. Messrs. Doulton & Co., of Lambeth, however, after a long course of experiments, have at length succeeded in soldering lead-piping to stoneware by what they call a "metallo-keramic joint." The stoneware, after baking, is metallized, by painting a belt on it with a composition containing platinum. It is then re-fired, and in this way the metallic band is incorporated with the body of the pottery, and forms a basis to which solder will firmly adhere. The joint in question has now been in use for eighteen months, during which it has been severely tested with perfectly satisfactory results. If a band of lead is soldered on to a piece of pottery in this way, and then stripped off by main force, the surface of the stoneware comes off with it. The staunchness of the joint has also been tested by soldering metal discs to the ends of a stoneware pipe. On applying hydraulic pressure, the pipe burst before the ends could be forced off. — *Engineering.*

TURNING GRANITE COLUMNS. — Granite for columns, balusters, round posts and urns is now worked chiefly in lathes, which for the heaviest work are made long enough to handle blocks 25 feet long and 5 feet in diameter. Instead of being turned to the desired size by sharp cutting instruments, as in ordinary machines for turning wood and metal, granite is turned or ground away by the wedge-like action of rather thick steel discs, rotated by the pressure of the stone as it slowly turns in the lathe. The discs, which are 6 feet or 8 feet in diameter, are set at quite an angle to the stone, and move with automatic carriage along the lathe bed. Large lathes have four discs, two on each side, and a column may be reduced some 2 inches in diameter the whole length of the stone by one lateral movement of the carriage along the bed. The first lathe for turning granite cut only cylindrical or conical columns, but an improved form is so made that templets or patterns may be inserted to guide the carriages, and columns having any desired swell may be as readily turned. For fine grinding and polishing, the granite is transferred to another lathe, where the only machinery used is to produce a simple turning or revolution of the stone against iron blocks carrying the necessary grinding or polishing materials. Blocks are prepared for lathe work by being roughened out with a point, and by having holes chiselled in their square ends for the reception of the lathe dog and centres. This principle of cutting granite by means of discs revolved by contact with the stone has been applied to the dressing of plane surfaces, the stone worked upon being mounted upon a travelling carriage, and made to pass under a series of discs mounted on a stationary upright frame. — *Mechanical News.*

LEAD FOUNTAINS. — None of the old English gardens were complete without a fountain, and no fountain was complete without a figure. Bacon says: "For fountains, . . . the ornaments of images, gilt or of marble, which are in use, do well."

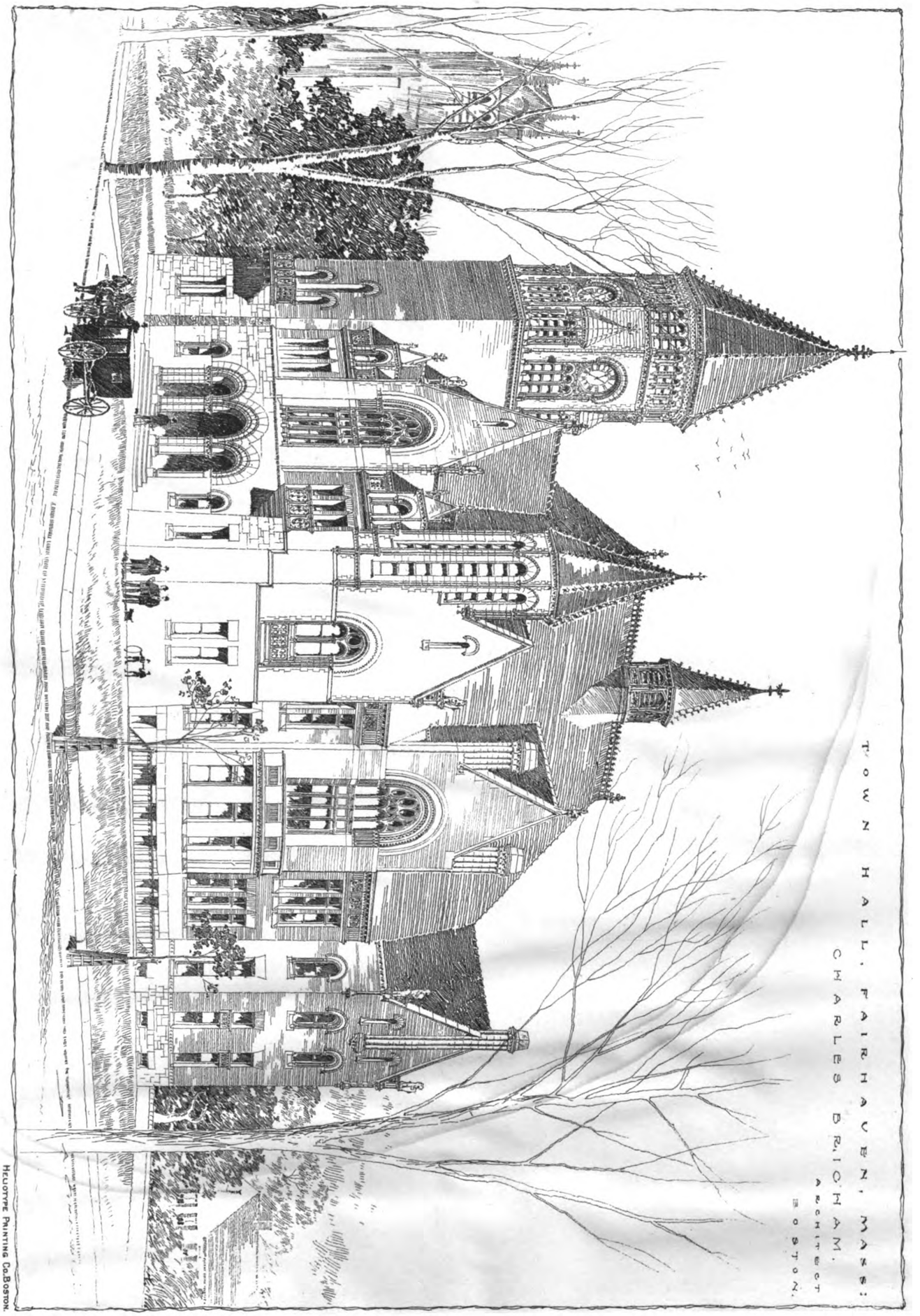
Paul Hentzner writes of the sixteenth century garden of Theobalds, the seat of Lord Treasurer Burleigh: "There was a summer-house, in the lower part of which, built semi-circularly, are the twelve Roman emperors in white marble, and a table of touchstone (alabaster); the upper part is set around with cisterns of lead, into which the water is conveyed by pipes so that fish may be kept in them, and in summer-time they are very convenient for bathing." At St. Fagan's, near Cardiff, in front of the house, is a remarkable lead tank;[1] it is octagonal, ten feet across and nearly four feet high; it is ornamented around the sides with flowers and shields in panels, and is dated 1620. At Lyon House there is a fountain in which a lead figure forms the jet d'eau. At Wooton, in Staffordshire, there is a fountain-basin with a lead duck so suspended as to float on the water spouting water from its bill. The swan which seemed to float on the water, described by Borrow, in "*Lavengro*," must have been of lead. At Sprotborough, in Yorkshire, are some lead toads, about nine inches long, which also seem to have belonged to a fountain. Some of the figures mentioned before stand in the centre of basins, and occasionally simple groups, as of Neptune in a two-horsed chariot, may be found, but we have nothing in England to compare to the great fountain compositions of the Versailles gardens or to the fountain called *Le Buffet*,[2] in the Trianon Park, designed by Mansard, and profusely decorated by the gilt lead-sculptures of Van Cleve and other artists. In Germany some of the earlier town-fountains are of lead. — *From Leadwork, by W. R. Lethaby.*

[1] See *American Architect*, January 27, 1894.
[2] See *American Architect*, April 5, 1890.

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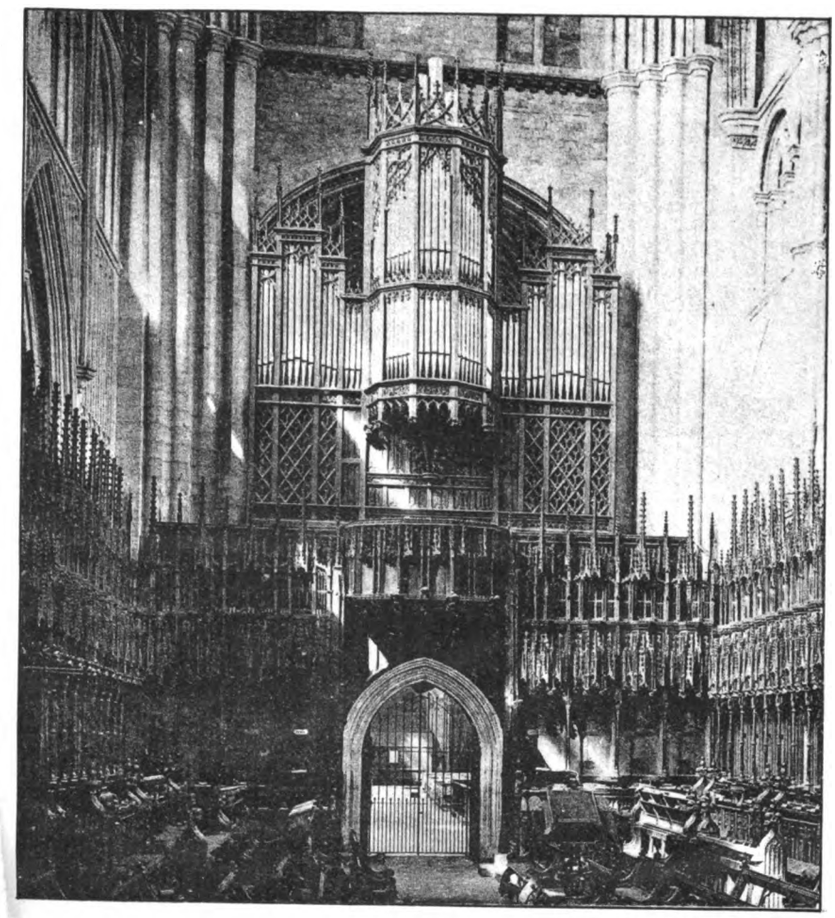
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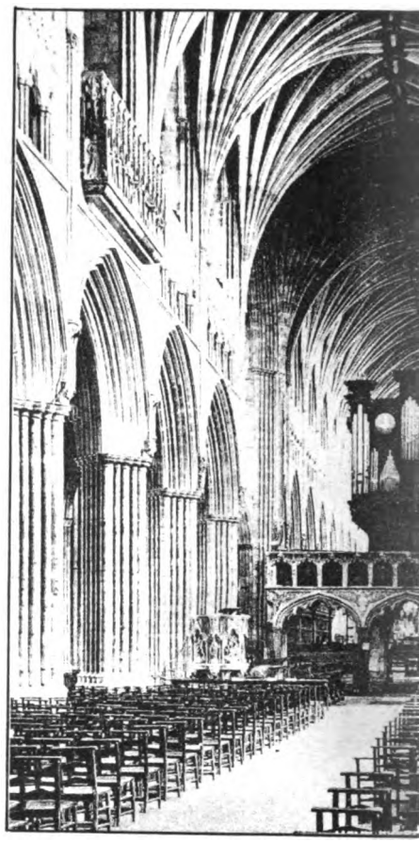
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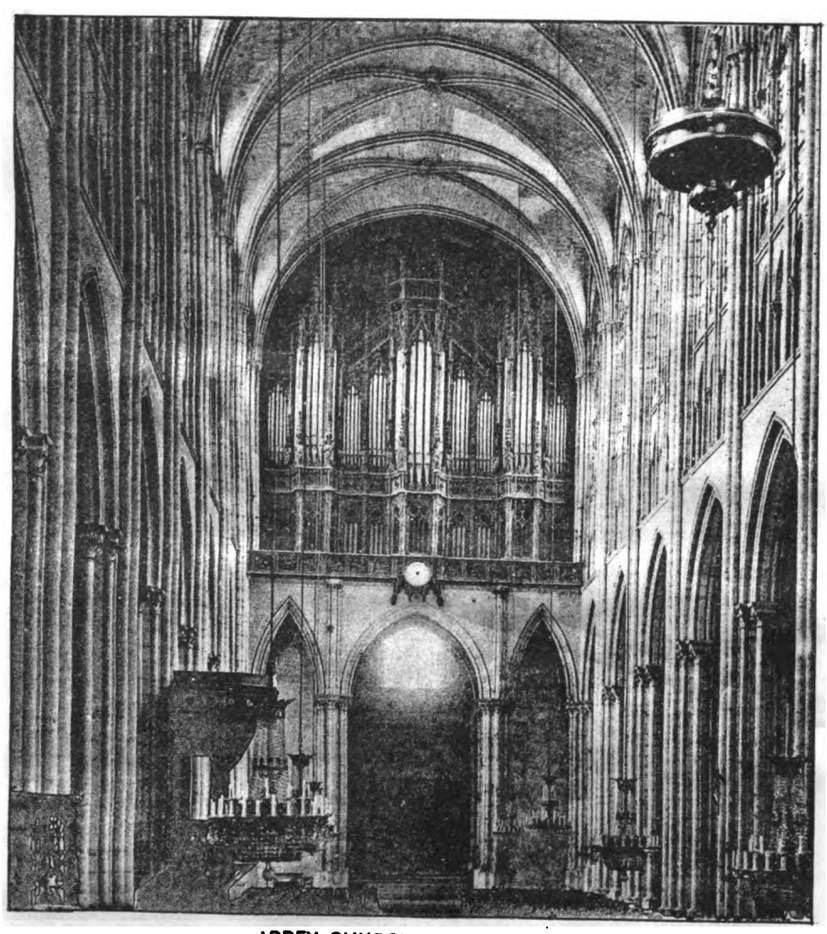
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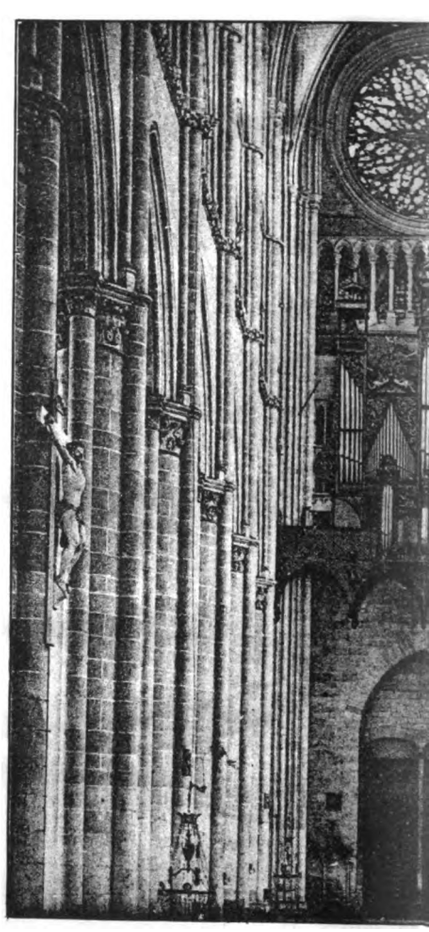
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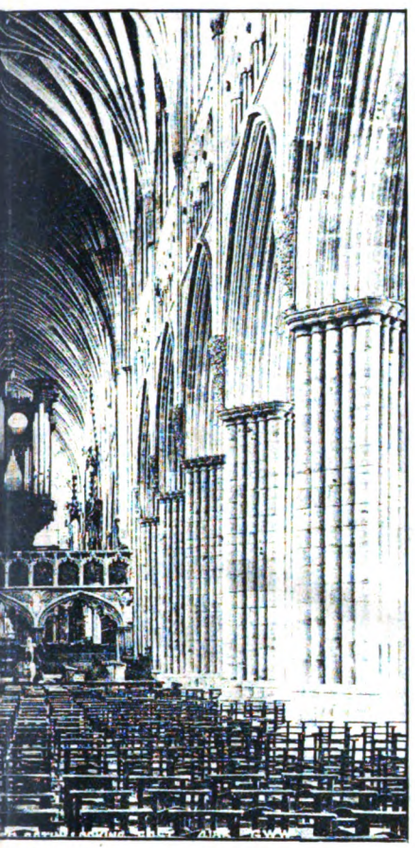


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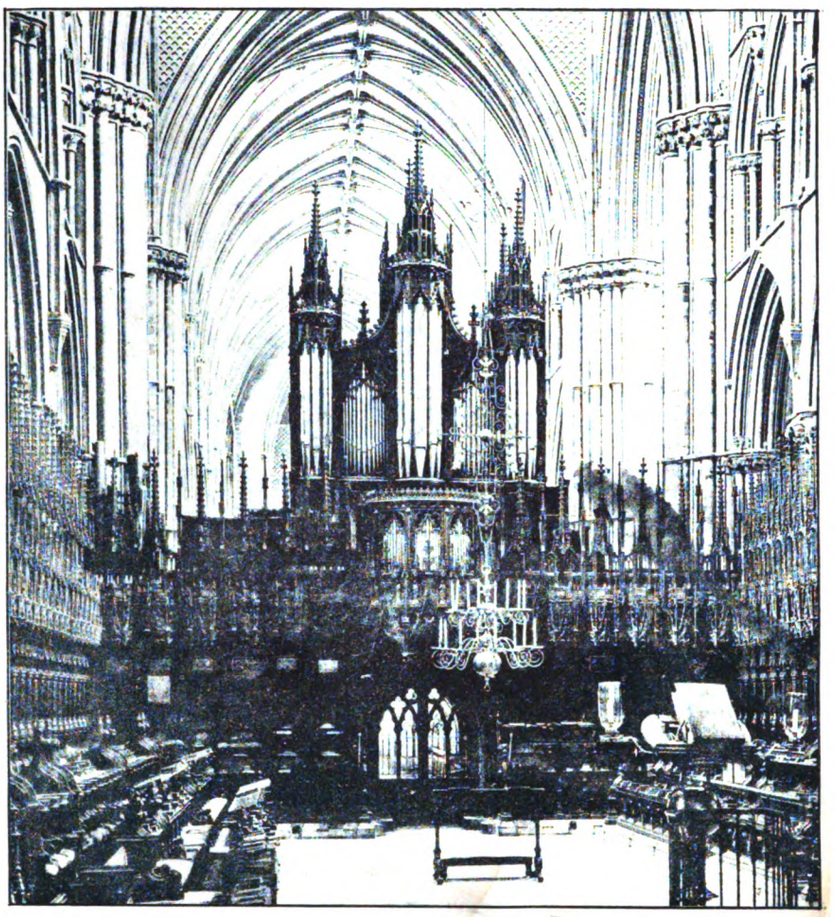
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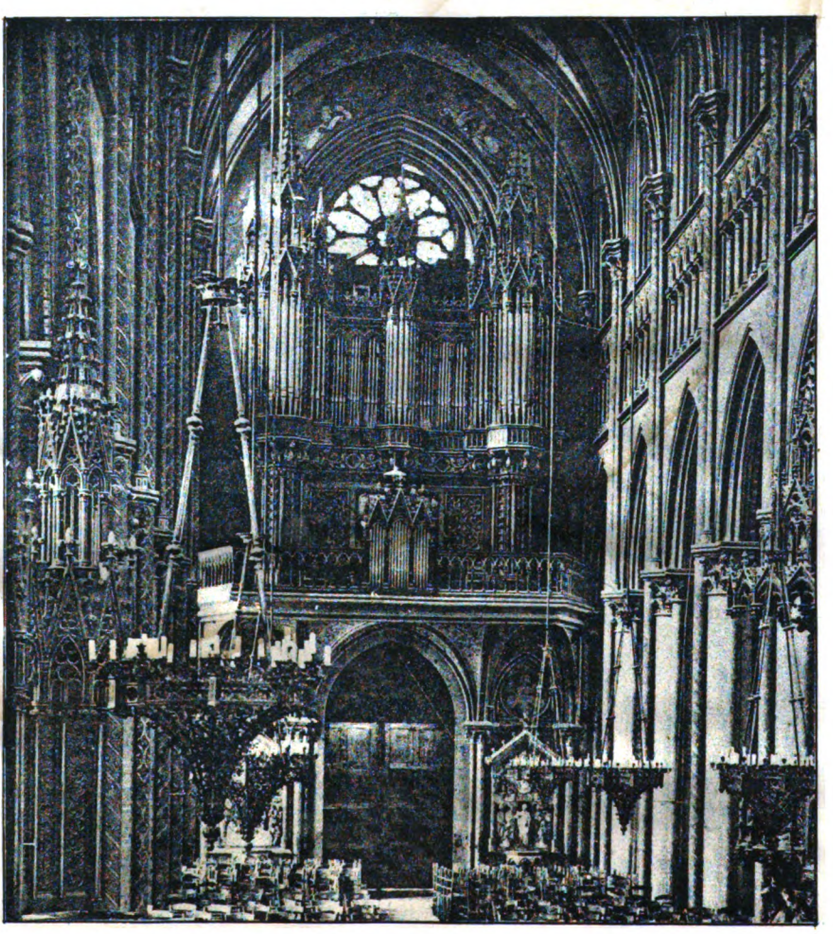
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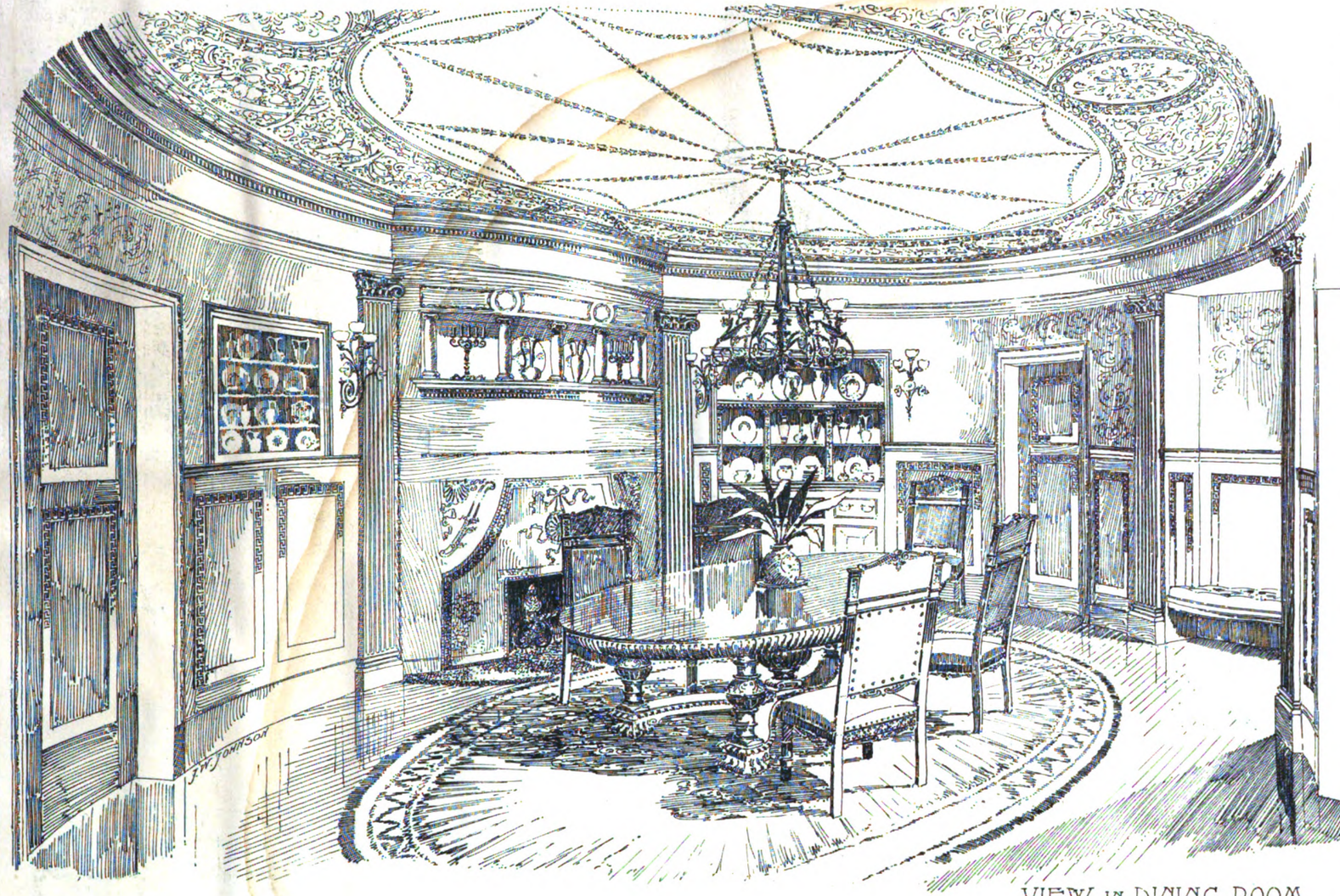
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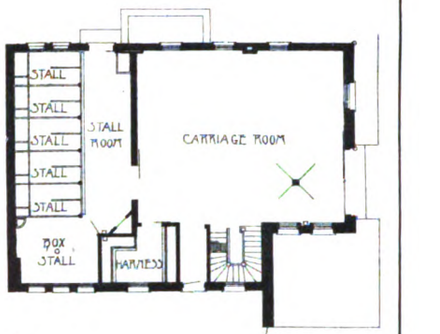
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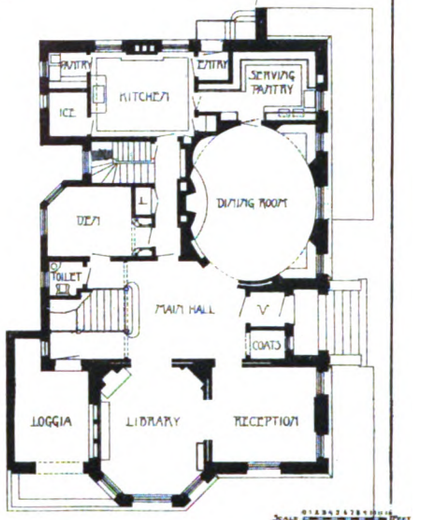
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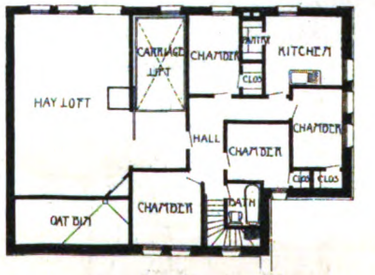


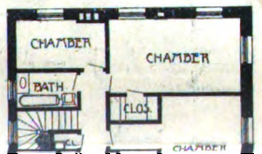
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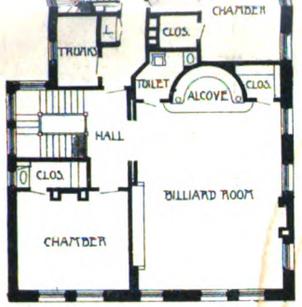


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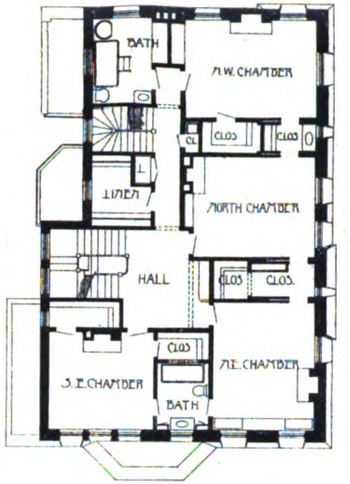
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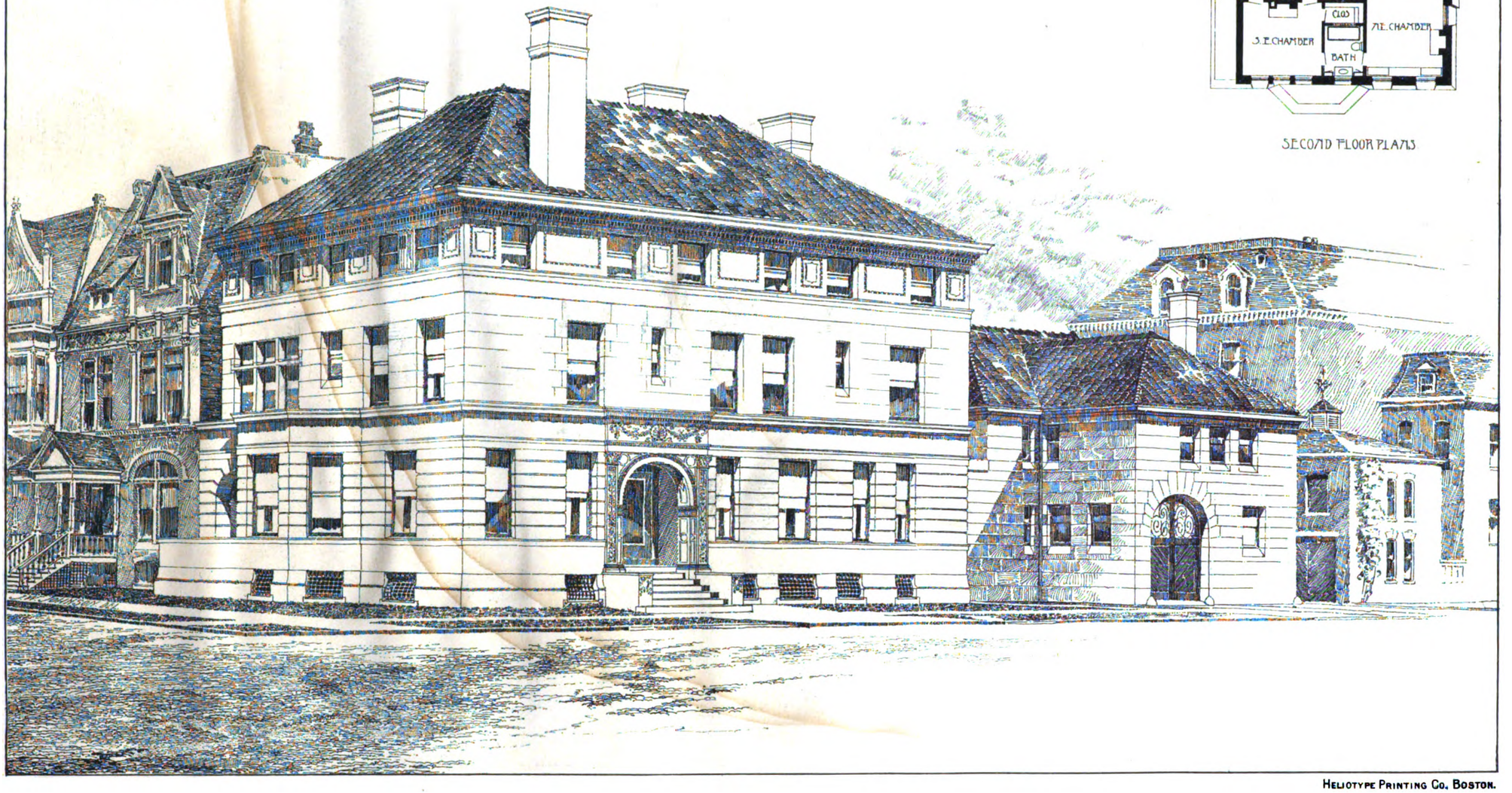
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THIRD FLOOR PLAN



SECOND FLOOR PLANS



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WE print elsewhere what seems to us the best presentation ever made in a court of record in this country, and perhaps the best ever made anywhere, of the duties of an architect. A firm of architects was obliged to sue a client for balance due for professional services. The client set up the usual defences: that the architects had disobeyed his instructions, to his great loss; that they had failed to use due skill and care in supervising the work, and that, in consequence, it was not done as it should be, and that the architects were responsible for his loss on this account; and that they had not delivered up to him the drawings of the building, and that, in consequence, their contract not having been completed, nothing was due them. One of the items on the bill was for plans made in accordance with the original wishes of the owner, which were afterwards thrown aside, and new ones made. In regard to these, the defendant claimed that they were thrown aside because they were made contrary to his wishes and instructions; and another claim of the defendant, in regard to the executed plans, was that he gave instructions to have an oval dining-room, and was promised one, but that the dining-room, when built, had one end truncated to accommodate a fireplace, thereby, in his opinion, injuring its appearance, and the value of the house. Of course, the decision, on most of these matters of fact, was left to the jury, but the judge, in commenting on the position that the architects would hold in case the jury should find the claims of the defendant well founded, expounded the subject of the relations of architects and their clients with remarkable clearness and learning. As the charge will go upon the records, and form an important precedent in this country, architects will do well to familiarize themselves with it, and, in case of need, to call it to the attention of their lawyers.

THE Trustees of the Sanitary District of Chicago have published a volume of five hundred pages, containing a history of the various attempts which have been made to dispose in a satisfactory manner of the Chicago sewage. Most people know that a great deal of work has already been done on the immense navigable canal, which is to connect the Chicago River with the Mississippi, and convey the sewage of Chicago to the Gulf of Mexico, but every one does not know that the idea of such a channel was suggested by Joliet and Father Marquette, the first white men who ever saw the Chicago River. Joliet, in 1673, on returning to Canada from his explorations in the Mississippi Valley, reported that "We can quite easily go to Florida in boats, and by a very good navigation. There would be but one canal to make, by cutting one-half league of prairie to pass from the Lake of the Illinois" (Lake Michigan) "into St. Louis River." The St. Louis River is now known as the Desplaines, and the new canal follows the route designated by the original explorers. By "boats," however, the moderns mean something very different from the canoes of the good French missionaries, and the Desplaines River will have to be very much widened and deepened before commerce can pass through it between Canada and the Gulf of Mexico. This widening and deepening, however, forms part of the present plan, and, when the Sanitary Canal is finished, Chicago will be the central point of a system of inland navigation extending from Labrador to the Rocky Mountains, and from Canada to Florida. That this will have an extraordinary influence upon the development of Chicago and the surrounding territory cannot be doubted. It is well known that canals are beginning to take a much more important part in commerce than they occupied a few years ago. The water-carried tonnage entering and departing from Paris, which is the centre of a well-studied network of canals, is said to exceed that of any seaport in the world; and a system by which boat-loads of iron-ore from Michigan, and coke from Pittsburgh, can meet at the Chicago rolling-mills, must soon materially affect industrial conditions. As a sanitary scheme, we are not sure that the canal is so commendable. There is no reason why Chicago should not, before very many years, have five million inhabitants, and the sewage from a city of that size would make a canal, even of the largest dimensions, and even with Lake Michigan as a flushing-tank, unwholesome. The Thames River would supply many canals with water, yet it has been found necessary to keep the London sewage out of it, and Chicago sewage is not likely to be any more innocent than that of London.

A VERY large establishment for the cremation of garbage has just been completed in St. Louis. It will be remembered that St. Louis has been almost the pioneer, among our large cities, in disposing of garbage in a decent and sanitary manner, and the new plant appears to embody the results of long observation and experience. The structure and machinery, with the land, are said to have cost two hundred and forty thousand dollars. The delivery of garbage from the carts takes place in the third story of the main building, which is floored with asphalt. Twenty-four huge tanks receive the material, which is then conducted by pipes to the dryers below. The dryers are practically jacket kettles, kept at a temperature of boiling water by steam circulating through the jackets, while revolving stirrers keep the material inside the kettles in motion. The vapors given off in this process are withdrawn by fans, and forced into the boiler furnaces. After drying in this way, the garbage is conveyed to the extractors, where it is saturated with naphtha, which is allowed to run in through pipes from a large tank outside the main building. After the naphtha has had time to dissolve out the grease and oil, it is pumped into stills, and distilled by steam-heat, the condensed naphtha flowing back into the main tank, while the greasy residue is collected in barrels, for sale to the soap-makers. The exhausted garbage left in the extractors is sold, without further treatment, to manufacturers of fertilizers.

A VERY curious device has recently been invented, by Mr. Von Hofe of New York, for assisting the efforts of firemen in forcing an entrance into burning buildings. It is obvious enough that the pressure of water in a fire-hose might be made available for driving a motor, and Mr. Von Hofe proposes to supply the fire-companies with portable motors, which can be immediately attached to a hose-nozzle, and are used to drive a crown saw, five or six inches in diameter. To use this apparatus, the motor is attached to the hose-nozzle, and the saw held against an iron shutter, or whatever else it may be desired to penetrate. The water is then turned on, and the saw begins to revolve, soon cutting a circular hole, large enough to put the nozzle through. The apparatus is then detached, the hose-nozzle inserted through the hole, and

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a stream of water directed where necessary. Where shutters, as in New York, open from the outside, this instrument would not be very necessary, but something of the kind might occasionally be of value for other purposes.

THE terrible earthquakes in Greece, besides the sympathy which they awaken for the unhappy people who have had their dwellings destroyed, and their friends crushed in the ruins, recall many historical reminiscences. Fortunately, or unfortunately, as the case may be, the earthquakes of two thousand years have left little Greek architecture standing, and archæological inquiry that takes the form of excavation has not much to fear from the shaking of the earth; but the attention which has been called to some of the places which have suffered most is likely to revive the legends connected with them in a way which will be valuable. For example, one of the towns which has suffered most is Larissa, in Thessaly, which is now a thriving city of fourteen thousand inhabitants, and has been a place of importance ever since a time so remote that history fails to give us any information in regard to it. All we know is that, many centuries before the Trojan War, a powerful people inhabited the country extending from the Persian Gulf on the east nearly or quite to the Atlantic on the west. Whether they were Accads, or Hittites, or Pelasgi; whether they were white, black or brown; whether their boundaries extended beyond the Himalayas, or into the Nile Valley; who were their neighbors, and how their territory came to be overrun, and divided among the distinct races which have occupied it during the historical and legendary period, we know nothing whatever, but we do know that their name for a city was Larissa, and places which retained that name through the historical period, and some of which, like the Thessalian town, have kept it to this day, are scattered through Mesopotamia, Asia Minor, Greece and Italy. Recent explorations in Greece, as well as in Asia Minor, have made it certain that a brilliant civilization had flourished and passed away there ages before Theseus fought with the Minotaur, or Hercules sat up in his cradle and strangled anacondas. Mr. Stillman observes, of some imposing ruins in the island of Ithaca, that they look to us just as they did to Ulysses and Penelope, and we know just as much as the hero of the Odyssey about who built them. In the average mind, curiosity in regard to a race so strange and long-forgotten is as strong as that in regard to their better-known successors; and it may perhaps be hoped that the commotions in regions less familiar to Classical students may result in discoveries which will throw light on a period long anterior, even to the time of Classical legend.

IN the death of Dr. John H. Rauch, for many years Secretary of the Illinois State Board of Health, sanitary science loses one of its most devoted followers, and the American community a member whose unselfish energy and skill has been of incalculable value. We should not dare to guess how many useful and happy lives have been saved, not only to Illinois, but to the other States whose health authorities have followed Dr. Rauch's teachings and example, but the number must run far up into the thousands. Besides the energy with which Dr. Rauch carried out the measures which it became his duty to execute, he was distinguished for a broad comprehension of sanitary problems, and a convincing earnestness in his writings in regard to them, which gave him great influence throughout the country, and his loss can hardly be made good.

AN architect a hundred years old died not long ago in England. The student of English architectural books will remember the name of J. C. Buckler, as the illustrator of some of the best of them, and, perhaps, as a brilliant water-colorist and draughtsman of architectural subjects. This Mr. Buckler, besides being an artist, was an architect of distinction in his day. His first important work was the splendid Costessey Hall, near Norwich, the seat of Lord Stafford, which was built in 1826, and is still often cited and illustrated as an example of English magnificence; and he was, later, the architect of many noted private mansions, and of a considerable number of churches, while his knowledge of mediæval architecture brought him much employment in the restoration of church and college buildings, particularly in and about Oxford and Cambridge. He even had what he considered a fortunate escape from building the new Houses of Parliament, his design having been awarded the second prize, in the competition held after the burning of the old House in 1834, and the history of the vexations which Sir Charles Barry and his family suffered in connection with the building shows that Mr. Buckler's opinion, that complete success would have shortened his life, was justified.

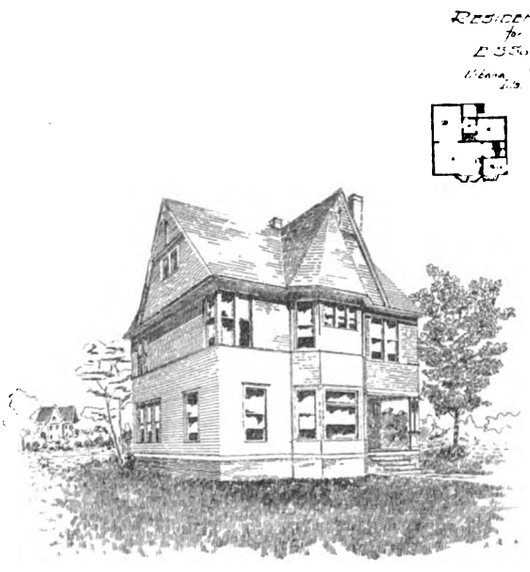
IT will be remembered that, some two years ago, Brother Paulin, director of the Agricultural Institute of Beauvais, following out an idea of the Abbé Bertholon, undertook to modify the electrical condition of the soil around growing crops, by laying wires in the ground, and connecting them with a sort of lightning-rod, placed in the centre of the field, and carrying a wire brush, for collecting electricity from the air. After a thorough, and not particularly sympathetic, test by various agricultural societies, this system has proved its value, and various medals have been awarded to its inventor. Where potatoes have been subjected in this way to electric influence, the yield has been nearly doubled, and the growth has been so luxuriant that shoots are said to have measured nearly eight feet in length. In vineyards, the electrified soil is said to have produced sweeter grapes than that not treated, and spinach in such soil grows with great luxuriance. The theoretical explanation of this phenomenon, as given by M. Berthelot, is a curious one. According to his observations, which are confirmed by those of other chemists, the activity of the little nitrifying bacteria which do so much work in the world is stimulated by an electric current; and the appearance of the electrified vegetables suggests that of plants highly nourished with nitrogenous applications. As nitrogenous food is just what the farms in our Eastern States lack, it is not impossible that the simple plan of running a network of wires under the surface, and connecting them with a cheap lightning-rod, might have excellent results in reclaiming the substantial, but impoverished soil of those States.

THE statistics of the production and consumption of natural gas in the Mississippi Valley for 1893 show clearly how limited the supply of gas is. In Pennsylvania, where, in 1888, the value of the gas produced was $19,282,375, the value in 1893 was only $6,488,000; and, as the average price paid for gas was much higher in 1893 than 1888, this falling-off in value indicates a much more serious falling-off in the supply. In fact, in Pennsylvania, as has often been noted of late, manufacturers are rapidly discontinuing the use of gas, and converting their furnaces back to proper forms for burning coal; and the gas will soon be used mainly for domestic purposes. In Indiana, which possesses a gas-bearing territory of immense extent, the supply is still said to equal the demand, but, as the demand is, as yet, only about one-fifth what it was in Pennsylvania, in the palmy days of the gas-wells, the probability is that the experience of Pennsylvania will, sooner or later, be repeated there.

THE uncertainty about what will become of the ruins of Philæ, in case a dam is built across the Nile, still continues. The project of carrying off the temples bodily, and putting them up somewhere else, seems to have been abandoned for the present, but the majority of the engineers of the Commission, including Sir Benjamin Baker, still advocate the construction of the dam just below Philæ, Sir Benjamin Baker offering to undertake to raise the temples, so that they will still be above water, although the island itself will be submerged. This proposition, as might be expected, still fails to please the archæologists. M. Boulé, the French member of the commission of engineers, refused to join with the majority in recommending the choice of the Philæ location for the dam, on account, it is said, of the injury to the island and temples. If this is true, as is quite likely, the circumstance affords a good illustration of the seriousness with which the French, whatever their profession, regard matters of art. To an American, or an Englishman, brought up in what he delights to call practical life, the idea that a person of mature age, and in full possession of his faculties, can take pleasure in memories or ideals is inconceivable. He is willing, out of good nature, to humor, to a certain extent, persons afflicted with this aberration of intellect, but the idea of sacrificing dollars and cents, or engineering economy, to such whims never enters his head.

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STYLE.[1]— III.



THE philosophy of Ruskin and that of Semper have their main points in common; both recognize a moral element and a material element. The moral element rests on the superior qualities of the soul, the material on the higher enjoyments capable of gratifying our senses; but not for a single instant can the two elements be dissociated; the one strengthens the other. It is this wholesome doctrine that we have adopted as our guide in the following analysis and synthesis of our subject.

The word *style* is derived from the Greek Στῦλος and the Latin *stilus*, a small pointed metal instrument used in writing and engraving. So style, in a figurative sense, is an *ensemble* of qualities peculiar to intellectual works brought forth under the influence of a common cause, whose mighty impulsive force leaves its impress on them as though engraven and serves to write the civilization of an epoch. These *general qualities*, requisite to productions of the brain, in order to portray faithfully the intellectual and moral aspirations or the material needs of the epoch at its zenith, are consequently purity, propriety, precision, clearness, naturalness and appropriateness.

Purity is one of the constituent parts of style, since it consists in the use of only those elements whose expression does not belong to various epochs. Details, being merely the consequence of a general conception, clothing a form to respond to a dominant want, following a principal direction and necessarily constituting but one with it, cannot be borrowed from different sources and must remain unmixed.

Propriety (from the Latin *proprius*, proper or peculiar) is the very act of the origin of style. The influence that presides at the advent of a certain style is peculiar to a determined epoch, and, when this influence passes, another succeeding it gives rise to a new style, separated from the first by a transitional phase having some hereditary relation to it. The predominating new character is soon strong enough to dictate a general direction for all the details to follow and indicates unmistakably the idea that instigated the initiatory movement. Some rather shallow thinkers have fancied that they have discovered certain future needs, which, however, time has not confirmed; they have drawn on the imagination for the creation of original types not subjected to the test of the rules laid down by that infallible guide, reason, and therefore the works executed after these types will always be unapprehended; still others have continued to live in the past. These last are dangerous laggards, for their aversion to change makes them the natural enemies of all progress.

Precision in the choice of forms most suitable for the material, in order to fulfil the office assigned to an organ by the quickening thought, is rigorously called for under penalty of engendering confusion. This choice, with certain artists, is the outcome of intellectual aspirations that serve as its factors and imperiously stimulate activity of thought, before it has as yet revealed itself to the masses; this is the thought of genius.

Clearness is requisite to meet the demands of a well-defined programme, whether it be purely material or whether it be moral and intellectual, although none the less real; otherwise it would no longer faithfully image the effects experienced by the majority of beings living and thinking at one epoch and subjected to the influences of the same *milieu*. All efforts tending toward a single end, the latent feeling of the mass, analyzed and comprehended by a certain number, is ere long readily expressed by a few who proclaim a style with its maximum of clearness.

Naturalness (from the Latin *natura*) is the quality of style that pertains to nature, is conformable to the natural order. Material and moral needs are the natural causes that stir the sentiments and rouse the faculties to effort, those sources of the force whence spring light and life. Sentiment is, then, the reaction produced in us under the influence of numerous causes brought to bear upon us. This sentiment sets thought in motion and solicits its action. Then it is that thought conceives the expression most perfectly interpreting its will — the result of a comparison of the needs with the means calculated to satisfy them — and enunciates the underlying principle (Latin *principium*, origin). To be perceptible, this expression clothes a form that must be adapted to productions of the industry best answering to the necessities of this action; it becomes the resultant of all the qualities of science and industry carried to the extreme of intensity and constitutes art (from the Greek, Ἀρετή, virtue, power) in its various evolutions. For this reason, we define art as the poetry of industry. It is the virtue, the generic power, inherent in a nation.

Genius (from the Latin *ingenium*, natural aptitude) brings together in one family the arts of like origin among all peoples of similar race. Thus it is that it has been said — and rightly too — that French architecture was inspired by the Latin genius. Naturalness is all the more necessary to style because, if it ceases to be in sympathy with the sentiments of the time, it leads the intellectual faculties astray and deprives them of all conviction based on truth to enlighten their faith. Art moves with uncertain step in the darkness, paralyzed in all its efforts, merely following a path that no longer leads it whither it should go and not daring to venture into another, owing to an entire lack of the analytical spirit, up to the moment when, after a more or less prolonged course of decadence, naturalness is once more attained and art is born again.

Appropriateness is one of the marks of style. It is the urgency of combining only such elements as have common ties, the impulsive force of a common thought having presided at their creation. It is the complete consistency of the expression and the thought, of the means and the end, of the organ and its function, the rational fitness of the material for the organ, the natural deduction of the decorative form from the material according to its aptitudes, the subordination of the whole to the original principle: sentiment.

Architectural style in ancient works, as well as in those of more recent times, offers, like all branches of philosophy, not only certain necessary qualities that we have just analyzed, but it likewise obeys the laws of esthetics (from the Greek αἰσθησις, perception), giving an individual character for each perception, and the laws of matter, by an application of the mathematical sciences, which, in order to render the expression of the thought visible and tangible, react on the form in view of the function.

The aim of *esthetics* is a study of the objective influences that succeed in charming us by the sight of the beautiful, and also a search into the subjective reasons for these influences, so as to deduce from them fixed laws embracing those principles that we regard as leading to truth; whence it follows that beauty may be considered as the splendor of truth. This beauty will consult the needs of the senses at the same time as the requirements of reason, so as to keep within the bounds of truth. In order to comprehend the sway of beauty over the senses, it must be noted that a body in contact, or at a distance, produces on the organs of sense an action called "impression"; and that these organs, after the direct perception of the impression, transmit it to the brain, where it is analyzed; the result of this analysis is sensation, which is translated by a sentiment. The debate between objective impressions and subjective sentiments ends in the empire of the one or the other and occasions an excitement, which is the mother of passion. Passion, in man, finds powerful auxiliaries in education and in surroundings, so that it is susceptible,

[1] From the French of Léon Labrouste, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 958, page 47.

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according to the nobility of one's character or the baseness of one's instincts, of becoming virtue or vice. Virtue may be said to lie in a rational harmony of the parts with the whole, as well as in a perfect balance between the end and the means used to attain it; but beauty, which is the manifestation of the invisible by the visible, of the quality by the expression, can fully satisfy only the senses of sight and hearing — the latter by music. Hence it may be said of man that he is really beautiful only so far as he, a moral and physical being, by a just proportion between all his faculties, expresses intelligence and force; but a monument may be termed beautiful when it, a material body, represents stability and when all its parts are in entire harmony with the reasonable moral and material wants of man, who is to make use of it. In architecture, man is clearly the goal set up by Nature toward which must be directed all those works of which he is the responsible author. Contrasts calculated to strike the senses constitute one of the means at our disposal for stirring the emotions: thus, a thing is great in contrast with a smaller one, it is powerful in comparison with a weaker, it is rich with relation to a simpler, it is luminous when accompanied by shadows to give it vigor; in architecture, its use may be emphasized by a correct balancing of the solid and open portions and of the depressions and projections; in a word, this thing impresses us in a way that was expected, premeditated and consequently reasonable, and also by true means, for without frankness in art all nobility disappears. As for painting and decorative sculpture, they must form a part, as it were, of the construction of the monument and accent its purpose. The ornamentation, whatever it may be, must not disregard the immutable principle of all art: sincerity. In spite of efforts and researches, beauty will never be perfect because its intermediaries are the senses; the end to be attained will forever rouse the emulation of artists. Out of this spirit of emulation have come works that reflect an entire world, an entire period, and whose creation has represented, almost always unconsciously, a collective product; this will continue to be the case.

The principles of style, to be correct, must necessarily harmonize with the dominant qualities that have been enumerated, since they are included in them and since they are deduced from the connection of these qualities with the creating thought. Upon the perfection of this accord depends the wonderful unity of a style at its zenith. Let us turn to painting, sculpture, engraving, music, literature, architecture, to all the arts, in short; if, by analyzing the dominant qualities, we succeed in separating the creating thought from the principles, we find what was the most earnest endeavor, the care that stood out most prominently, that stamped its seal upon all contemporary productions, and such care becomes characteristic. Every people, at some moment of its existence, according to its own ideal, has sought to image a theme that was growing to be its favorite; at the time, this theme engrossed its attention and was manifested in a remarkable way in its productions; so we must seek out their characteristics, and we may conclude that *style* is *the characteristic expression befitting the dominant need of an epoch.*

The dominant need of a people has varied with its ideas according to the times and has called out works, embracing all the virtues of style and quite unlike each other; the term "styles" has been applied to these different characteristic expressions, by extension, so as to distinguish between them.

The characteristics then enables one to classify styles, by assigning a certain date to them according to their historical connection and their relations to each other; but, for that, it excludes the archæological eclecticism (from the Greek Ἐκλεκτικός, choice) of those who, by combining divers elements, pretend to revive styles no longer belonging to their normal epoch. Though a knowledge of their evolutions is requisite, one must draw therefrom only such philosophical inferences as are to be deduced, and he must not enslave himself to their forms. In fact, when certain expressions have lost their significance and yet maintain traditional forms that have ceased to answer to the thought, — a sort of language whose words have no equivalent in our needs, either from an esthetic or scientific and practical standpoint, which perpetuates a symbolism that finds no response in the moral training of the masses — thought becomes hieratic, strays from Nature's teachings and lives in conventionality; it is no longer nourished at its native sources and art falls into decadence. Art ceases to be comprehended by all, and then follows that state of social unrest that marks the troubled times when artists, charged with the duty of expressing in clear and precise phrase the common will, are at variance with the majority, speak a dead tongue and remain powerlessly isolated.

So requisite to style are the qualities and laws that we have presented that not one can be dispensed with, and they serve as guides in all archæological classification. According to our interpretation, national genius may be said to have engendered art, of which style, with its fundamental principles, often preserving the same peculiar characteristics for several successive periods, constitutes the first division; consequently, the periods will be divisions of style and sub-divisions of art; then the union of epochs will form the period, and the years will fix the exact limits of the epoch. Thus, the following order will be obtained: *national genius, art, style, epoch, year.* The term *century*, or *age*, is frequently used to designate a period, and *reign* to indicate an epoch.

But style must not be confounded with mode. The latter, as the word shows (from the Latin *modus*, peculiar manner of being or doing), is individual, peculiar to one or another branch of human thought; it is the child of fancy, it does not form a unit with what is about it, it shuns the rules of common-sense and heeds whims alone. Therefore, as soon as a mode has gone by, it appears before us in all its ridiculousness and shocking incongruity; it is the unearthing of a past, with no accompaniment or justification; it is an isolated fact wholly out of harmony with the surroundings. We often invoke progress to keep up fashion, confusing the pleasure of change with progress. Progress is based on truth which leads to beauty, and truth, to manifest itself, requires liberty; license must not, however, be mistaken for liberty — the one recognizing no law, no principle, the other having reason as its express limit. Style and mode are not interchangeable; they are essentially different; the one excludes the other; the one kills the other.

The characteristic of style rises and falls with the intellectual and moral level of a people, and, consequently, with its degree of civilization; this fact enables us to determine by the subordination of the execution to principles, since the execution springs from the thought to which it contributes, whether art is, or is not, at a moment of decadence. In truth, decadence can be readily detected in a work, for art is no longer at its zenith, if there is a want of balance in the conception between the needs and the means; in such cases, processes maintain a skill superior to and independent of the needs to be satisfied, and are a sure indication of a weakening of the original principle; while, on the contrary, if the means and processes do not come up to the needs, it may be assumed that art is in its infancy and is preparing for an upward flight.

[To be continued.]

NEW THEATRES AT BERLIN AND THEIR SAFETY AGAINST FIRE AND PANICS.

BERLIN, Germany's brand new capital city, is gradually getting a fine set of theatres built. The first modern play-house was the Lessing Theatre[1], put up by Messrs. Hude & V. d. Hennicke of that city and holding an audience of 1,100. Then came Ronacher's Variety Theatre, built by the Messrs. Fellner & Helmer, of Vienna, for an audience of 2,000 and then the "New Theatre" with seating capacity for 800, for which Herr Heinrich Seeling of Berlin acted as architect. The next new play-house will be a so-called "Peoples' Theatre," the funds for which are now being collected by public subscription. These new erections, as also the various alterations which are being made at the Royal Opera House, the Royal Play-house and several private theatres, have to be carried out in accordance with the stringent police regulations which came into force some three years back and which now, having stood a fair trial, are to be considered final, excepting in a few points relating to the remodelling of old structures. These regulations may be termed interesting, especially as we hear that they have been the outcome of some eight years' inter-remittant labor of various Government committees and experts, afterwards practically put into shape by the zealous chief of the Berlin Police Fire-brigade, Herr Stude, who met with an untimely death a few months back.

Looking at these regulations as a whole, one sees that the chief aim is to prevent the danger to life and limb caused by panics founded either on real or false alarms of fire. Very exact rules have been laid down as to the number of exits, and the convenience of getting at them from every seat in the building — the width of the doors, passages, stairs, etc., having to be in a certain ratio to the number of people likely to use them; and a common method of describing the routes to be taken to gain the open has been arranged.

As panics are known to be just as dangerous in absolutely fire-proof buildings as in those of more combustible nature, not half so

[1] See *American Architect* for May 12, 1894.

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much stress has been laid on the materials themselves as is generally the case; in fact, that part of the regulations referring to the safety of the building itself has been put quite into the second place. Wooden columns, flooring and corridor-partitions are distinctly permitted, and even wooden staircases can, as a rule, be erected, only a few exceptions being made in favor of iron. Wooden staircases are considered to be safer than either those of stone or iron, especially if the underside of the wood has a good coating of plaster.

The Commission has considered it to be of great importance that smoke or suffocating gases should be stopped from entering the passages and staircases. In order to avoid this, ventilating-flues, easily manageable in case of need, have to be made both over the stage as well as in the ceiling of the auditorium, and the disposition and construction of the flues are subject to very stringent rules. It is chiefly to prevent the smoke from filling the auditorium too rapidly that the so-called fireproof curtain divides the theatre into two parts. Its substance is simply required to be incombustible, but its work is distinctly not to be automatic; in fact, no self-working contrivance is permitted in any position where it would be of importance if it did not work. Such doors as may be required in the wall between stage and auditorium are to be of hard wood, plated on both sides with iron.

The impregnation of stage paraphernalia, so as to render it uninflammable, is *not* required, but the scenery itself is to be of as uninflammable a nature as possible. A substitute for canvas is not definitely mentioned in the regulations, but the official "*Centralblatt der Bauverwaltung*" recommends a certain cloth of wire-netting and asbestos, invented by a Berlin firm.

The Commission has set down several paragraphs concerning the lighting, ventilation, etc., but no novelties are to be found in these parts of the rules.

As will be seen, the above regulations taken as a whole do not exactly tend to throw any new light on the question of theatre protection, excepting in the one important case that the authorities apparently wish to express forcibly that their efforts are not intended for the good of the proprietors of theatre property, but solely for the benefit of the public. It is all the same to them if a theatre or a store burn down, and fire in the former would be even less likely to spread and endanger neighboring property on account of its isolation. But, at all cost, the public are to have facilities for saving themselves if they chance to be in the building at the time of a mishap. As soon as there is no public in the place a theatre fire will rank exactly as any other and if the proprietor has used wooden columns or staircases he must risk their destruction. It is, however, unlikely that wood will be used, owing to the extra cost it would throw on the proprietors in the way of insurance rates.

Now, to see that these rules are carried out, the ever-thorough Berlin authorities have an excellent Police Board-of-Works with Crown surveyors attached and there is little chance of avoiding them. The actual management of the house, which is treated of in a separate set of paragraphs, as well as the general state of the building after it has once passed the authorities, are further subject to quite a complicated scheme of regular survey which is carried out with wonderful exactitude. There is the committee of the Police Fire-brigade and building officials that regularly inspect the theatres at odd times. There is the regular inspection of the district fire-marshal once a fortnight by day and once a fortnight after dark, at odd times also. Then there are the regular inspections of the lieutenants of the Fire-brigade practically every evening at odd times, and, further, the authorities have strong fire-watches stationed in the buildings during the performance, under the command of a senior non-commissioned officer, besides a patrol of police in the "front" of the house under a commissionaire to see that all the exits are free and regulate the crowd as far as possible, if necessary. The fire-watches are composed of the senior men of the Royal Police Brigade and have the necessary powers to prevent at any moment any dangerous action in the house, and the managers well know that in case of any opposition on their part to act in the interests of public safety, it would only take a few minutes to have the theatre closed by them if need should be. In spite of the tension, things, however, work very smoothly and, though there was some bad blood at first, there has neither been any unnecessary overbearing on the part of the officials nor rowdyism on the part of the theatre employés. The laws are being stringently carried out, it is true, but the public know it and feel such confidence in their officials that a case of panic or disorder is getting more and more unlikely. Berlin's theatre enterprise is hence not dangerous for the public, and the population can be congratulated on the many fine places of entertainment now given them. EDWIN O. SACHS.

THE ITALIAN RENAISSANCE[1]. — III.

HINTS TO TRAVELLING STUDENTS. — THE PALACES OF ROME.

THE pontificate of Nicholas V marks the beginning of the palace-building, as of the ecclesiastical architecture, of the Roman Renaissance. It was he who first conceived the notion of remodelling and symmetrizing the miscellaneous group of more or less dilapidated buildings belonging to the popes in the vicinity of the ruined S. Pietro in Vaticano. But this project, like that for the re-edification of the old basilica, fell through for the time being, and was not finally put into execution until fifty years later, when Bramante began the great Belvedere Court and the Court of San Damaso, about 1506. Meanwhile, however, the great palace of Venice, with its adjacent court and loggia ("the lesser palace of Venice" according to Letarouilly) had been erected, perhaps from designs by Bernardo di Lorenzo (or Alberti?) and Baccio Pintelli, and Bramante had himself begun and partly or wholly completed the Sora, Cancellaria[2] and Giraud palaces.

The growth of a powerful ecclesiastical aristocracy of great wealth and splendor, the pontificate of men like Julius II, Leo X, and Paul III, the cessation of such murderous feuds as had earlier disturbed the peace — that between the Orsini and Colonna families, for example — and the advent of Bramante, Peruzzi and Raphael, Sansovino and the San Galli to Rome, all combined to make the first half of the sixteenth century a period of unexampled brilliance and activity in the building of palaces. The new taste in art — for which the way had been prepared by the Humanist movement and by the rich collections of antiques which had accumulated in princely houses and in the Vatican through the Middle Ages and the fifteenth century, and now received constant accessions from all over Italy — had been slow in asserting itself in Roman architecture, but now became supreme. The ancient ruins were being studied and measured by Palladio and others, while they were at the same time being stripped or demolished to provide materials for the palaces rising on every hand. New churches, nearly all with domes, were erected, and a long series of "restorations," embellishments, and alterations of the old basilicas was begun. From this time on, nearly every Italian architect of distinction found in Rome the widest and richest field for his activity.

The Roman palaces and *case*, or larger private residences, are distinguished by the prevalent dignity and simplicity of their façades and the amplitude of their plans. The court-yards are generally spacious, and in most cases their surrounding arcades do not support the main court-walls, which rise in the plane of the rear walls of the arcade-passages. Most of the arcades, or *loggie*, are in two stories, generally of arches of the Roman type, *i. e.*, carried by heavy piers fronted by decorative orders, and not, as in Florence, supported on free-standing columns. The exteriors of the palaces, whether of stone or stuccoed brick, depend for their architectural effect more often on the judicious proportioning of the different stories, the profiling of the string-courses and cornices, and the elegant disposition and spacing of the openings, than on adornment by columns or sculpture. The ground-floor, or *piano terreno*, is devoted to the domestic service, to shops, or to other subordinate uses; the second story (*piano nobile*) to purposes of state and festivity, the upper floors only being designed for actual residence. Communication between the rooms is had mainly by the arcades, the great salons and festal halls of the *piano nobile* being usually arranged *en suite*, without independent communications; so that for modern living-purposes they have had in many cases to be cut up by plaster partitions into smaller apartments and corridors. The staircases are of stone, and seldom treated with any special architectural elegance or prominence, except in the later palaces, like the Barberini and Braschi.

Of the eighty to one hundred palaces and *case* enumerated in the guide-books and descriptions of Rome, a partial list is given below. The dates and names of architects are given under all reservation, as detailed investigations from time to time overthrow long-accepted theories on these points. The chronology of the Vatican is given separately at the end of the list.

A. PALACES OF THE FIFTEENTH CENTURY.

1. PALACE OF VENICE: 1468, *Bernardo di Lorenzo.* Second court of same, called by Letarouilly the "Lesser Palace." *cir.* 1475; *Bernardo di Lorenzo* or *Baccio Pintelli.* (Letarouilly ascribes the "Greater Palace" to *Giuliano da Majano* and the lesser to *Pintelli;* Baedeker attributes the whole to *Alberti*, and Lübke to *di Lorenzo*, as above.)
2. COURT OF SAN SPIRITO IN SASSIA: 1471, *Baccio Pintelli.*
3. PALAZZO DEL GOVERNATORE: 1490. (?)

B. PALACES OF THE SIXTEENTH CENTURY.

4. PALAZZO SORA: 1501, by *Bramante.*
5. PALAZZO GIRAUD (Torlonia): 1504, *Bramante.*
6. PALAZZO PALMA: 1506, *Antonio da San Gallo*, the younger.
7. PALAZZO CANCELLERIA: 1508 (?) *Bramante.* The main entrance, by *Domenico Fontana.*
8. PALAZZO DORIA PAMFILI: 1508, *Bramante.*
9. PALAZZO ORSINI: 1510, *Baldassare Peruzzi.*
10. PALAZZO FARNESINA: 1516, *Baldassare Peruzzi.* Frescoes in loggia, by *Raphael, cir.* 1518.
11. PALAZZO STOPPANI (Ugguceone or Vidone): 1518, from designs by *Raphael;* erected by *Lorenzetto.*
12. PALAZZO LAUTE: 1520, *Baldassare Peruzzi.*
13. PALAZZO NICCOLINI: 1520, *Giacomo Tatti Sansovino.*
14. PALAZZO OSSOLI: 1525, *Baldassare Peruzzi.*
15. PALAZZO FARNESE: 1530, begun by *Antonio da San Gallo*, the younger; court-arcade by *Vignola, cir.* 1540; upper stage of arcade and cornice by *Michael Angelo;* completed, and central loggia added, by *Giacomo della Porta.*
16. PALAZZO BUFALO (della Valle): 1530, by *Lorenzo Lotti.* Ceilings by *Giulio Romano.*
17. PALAZZO ALTEMPS: 1530, *Baldassare Peruzzi;* completed by *Martino Lunghi*, the elder, in 1570.
18. BANCO DI SAN SPIRITO: 1532, *Antonio da San Gallo*, the younger.
19. PALAZZO ANGELO MASSIMI: } 1532, *Baldassare Peruzzi.*
20. PALAZZO PIETRO MASSIMI: }
21. PALAZZO LINOTTA: 1534 (Baedeker says 1515), *Baldassare Peruzzi.*
22. PALAZZO SACCHETTI: 1540, *Antonio da San Gallo*, the younger.

[1] Continued from No. 958, page 49.

[2] There is not space here to discuss the question of the significance of the date 1495 on this palace, whether Bramante actually visited Rome previous to 1501 or merely completed and altered a palace begun before his arrival, is not here material. The palace, as it stands, is certainly his design in all essentials, and as certainly belongs mainly to the first years of the sixteenth century.

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23. Palazzo dei Conservatori: the first of the group on the Capitol (Campidoglio), designed and begun, 1540, by *Michael Angelo.*
24. Palazzo di Firenze: built on site of earlier palace, 1540, by *Giacomo Barozzi di Vignola;* (Farnese, upper stories, façades and court, by *Michael Angelo* and *Giacomo Barozzi di Vignola,* 1547, see 15.)
25. Palazzo Lancelotti: 1560, by *Pirro Ligorio.*
26. Palazzo del Senatore: second of the group of three on the Campidoglio, (sometimes called "Palazzo del Campidoglio"), 1563, after designs by *Michael Angelo;* executed with slight modifications by *Giacomo della Porta* and in 1610, by *Girolamo Rainaldi;* the square tower in 1580, by *Martino Lunghi,* the elder; see 23.
27. Palazzo Negroni (di Sermonetta): 1564, *Bartolomeo Ammanati.*
28. Palazzo Spada: 1561, by *Giulio Mazzoni;* (exterior decoration in stucco-relief, by *Borromini.*)
29. Pontifical Palace on the Quirinal (commonly known as the Palazzo Quirinale; recently seriously injured by fire): 1574, by *Domenico Fontana;* enlarged 1606, by *Flaminio Ponzio* and *Carlo Maderno;* in 1655, by *Lorenzo Bernini;* and in 1737, by *Ferdinando Fuga.*
30. Universita della Sapienza: façade and court, 1575, by *Giacomo della Porta.*
(Palazzo Farnese: lateral façade on Via Giulia, 1575, by *Giacomo della Porta;* see 15.)
(Tower of the Capitol: 1580, by *Martino Lunghi,* the elder; see 26.)
31. Collegio Romano (Museo Kircheriano): 1582, by *Bartolomeo Ammanati.*
32. Pontifical Palace of the Lateran (Museo Laterano); 1586, *Domenico Fontana.*
33. Palazzo Borghese: 1590, *Martino Lunghi,* the elder.

C. PALACES OF THE SEVENTEENTH CENTURY.

34. Palazzo Sciarra Colonna: 1600, *Flaminio Ponzio.*
35. Palazzo Rospigliosi: 1600, *Flaminio Ponzio.*
36. Palazzo Mattei di Giore: 1602, *Carlo Maderno.*
(Enlargement of Quirinal Palace: by *Flaminio Ponzio* and *Carlo Maderno,* 1606; see 29.)
37. Palazzo Barberini: 1627, *Francesco Borromini;* staircase by *Lorenzo Bernini;* other additions by *Carlo Maderno.*
38. Museum of the Capitol: the last-built of the three palaces on the Campidoglio, 1644-50, from the designs of *Michael Angelo;* superintended by unknown (?) architect; see 23 and 26.
39. Palazzo Pamfili on Piazza Navona: 1650, *Girolamo Rainaldi.*
(Further continuation of Quirinal Palace: 1655, by *Lorenzo Bernini;* see 29.)
40. Palazzo Odescalchi: 1660, *Lorenzo Bernini.*
41. Palazzo Altieri: 1674, *Giovanni Antonio di Rossi.*

D. PALACES OF THE EIGHTEENTH CENTURY.

42. Palazzo Torlonia (Bolognetti): 1700, *Carlo Fontana.*
43. Palazzo Colonna: 1730, *Niccolo Michetti* and *Paolo Posi.*
44. Palazzo Corsini: 1736, *Ferdinando Fuga.*
(Completion of Quirinal Palace: 1737, by *Ferdinando Fuga;* see 29.)
45. Palazzo Braschi: 1790, *Morelli.*

46. E. PALACE OF THE VATICAN.

a. The Sala Regia and alterations in 1473 (?), by *Baccio Pintelli.*
b. Court of San Damaso, with the loggie: 1506-1520, by *Bramante;* frescoes by *Raphael, Giovanni da Udine,* and
c. Court of the Belvedere: 1500-1520, by *Bramante.*
d. Remodelling the Belvedere proper: octagonal court of same; 1510, by *Bramante.* "Restored" by *Simonetti* in 1750.
e. Capella Paolina: 1540, by *Antonio da San Gallo,* the younger.
f. Library of the Vatican (dividing Bramante's great Belvedere Court in two): 1588, by *Domenico Fontana.*
g. The Scala Regia: (?), by *Lorenzo Bernini.*
h. Pontifical Residence: 1589, by *Domenico Fontana.*
i. Gallery of the Candelabra: 1780, *Michael Angelo Simonetti.*
k. Museo Pio Clementino: 1780, *Michael Angelo Simonetti.*
l. Braccio Nuovo: 1817, *Raphael Stern.*

VILLAS OF THE RENAISSANCE.

The Roman villas were the suburban residences and pleasure-houses of the wealthy nobles and princes of the sixteenth and seventeenth centuries. They comprised vast gardens with terraces, labyrinths, cascades and summer-houses, besides the villa proper and its casino. The villa proper was not always adapted for prolonged residence, but seems to have been planned with special reference to receptions, festivities and other entertainments rather than to comfortable lodging or quiet domestic life. The casino was a species of play-house, often converted into a museum of antique and modern sculpture, though sometimes such collections were provided with a separate building, and sometimes were accommodated wholly in the villa proper. In these villas the traditions of the Roman villas of antiquity and of antique Roman landscape-gardening were revived and carried out with great splendor; and their gardens are perhaps now, certainly were once, the most beautiful in Europe. Many of them have been in recent years sacrificed to the greedy real-estate speculations of their hereditary and princely owners, who have cut them up into building-lots. A few of the most important only are here enumerated.

1. Villa Madama: 1520, by *Giulio Romano.* (Celebrated for its stucco enrichments.)
2. Vigna Papa Giulo: 1534, *Baldassare Peruzzi.*
3. Villa Medici (Academy of France): 1540, by *Annibale Lippi.*
4. Villa of Pope Julius: 1553, *Giacomo Barozzi di Vignola.*
5. Villa Pia (Vatican Gardens): 1561, *Pirro Ligorio.*
6. Villa Farnesiana: 1570, *Giacomo Barozzi di Vignola* and *Gir. Rainaldi.*
7. Villa Mattei: 1582, *Giacomo del Duca.*
8. Villa Borghese, on the Pincian: 1616, *Giovanni Vasanzio.*
9. Villa Ludorisi: 1623, *Domenico Zampieri.*
10. Villa Pamfili: 1644, *Alessandro Algardi.*
11. Villa Albani: 1760, *Carlo Marchionne* from designs by the Cardinal Albani.

GATES, FOUNTAINS, ETC., IN ROME.

1. Porta Pia: 1561, by *Michael Angelo.*
2. Porta del Popolo: 1562, *Michael Angelo* and *Giacomo Barozzi di Vignola.*
3. Fountain Felice ai Termini: 1588, *Domenico Fontana.*
4. Fountain of the Triton, Piazza Navona: 1580, *Giacomo della Porta* (?).
5. Aqua Paola: 1612, *Giovanni Fontana* and *Carlo Maderno.*
6. Fountain of the Triton, Piazza Barberini: 1640, by *Lorenzo Bernini.*
7. Fountains, Piazza Navona: 1650, *Lorenzo Bernini.*
8. Fountain of Trevi: 1735, *Niccolo Salvi.*

It is impracticable here to give any list of the monuments, tombs, tabernacles and altar-pieces of the Renaissance in Rome: such a list would be too long for insertion, and hardly necessary to the student, since there is scarcely a church in the city but possesses some more or less interesting example of this department of architectural art.

A. D. F. Hamlin.

[To be continued.]

THE SUPREME COURT OF MAINE ON THE DUTIES OF ARCHITECTS.

THIS was the charge to the jury in a case recently tried before the Supreme Court of Maine. The case brought up the rights and duties of architects with unusual distinctness, and it was necessary for the judge to instruct the jury in regard to the law on the subject. The instruction was given in the following words, which contain so clear and admirable an exposition of the question that we reproduce it, from the official stenographic record, in advance of the regular publication in the Maine Reports. — Eds. American Architect.

State of Maine, Hancock County.
Supreme Judicial Court, January Term, 1894.

Arthur Rotch *et al.*
vs.
Maria D. B. Fry *et al.*

CHARGE.

Gentlemen of the Jury: —

The plaintiffs are a firm of architects, in the City of Boston, of long experience and skilled in the art of building. The defendants, the owners of a site for a house or a residence which they contemplated building, at Bar Harbor, applied to them and sought their services. They inquired of them their terms, and there was handed to them a schedule of prices. With that they appear to have been satisfied, and thereupon engaged them to perform the work, and, in the absence of any further stipulation or agreement between them, the law would imply a promise on their part to pay the prices there stipulated. So that, in this case, the prices which they would be required to pay, and which the plaintiffs are entitled to receive, are the prices given according to the schedule which was furnished to the defendants at the outset. So far they cover the services that were called for or were required. I do not understand that the learned counsellor for the defendants denies this. On the other hand, I understand him to admit that, if his clients are liable at all in this case, they are liable to pay for the services charged according to that schedule, less so much as shall be deducted therefrom on account of conditions that I may call your attention to hereafter.

It appears that the defendants carried to the plaintiffs' office some sort of a typographical sketch or plan of their house site. The plaintiffs did not visit the locality and did not have an opportunity to examine the ground. I do not know that it appears in the case that they were requested so to do, or required so to do at any rate. I think there was some testimony on the part of some of the witnesses as to whether it would or would not be necessary. At any rate, the services were undertaken to be performed without visiting the locality, the plaintiffs being guided by such information as the defendants could give them and such information as the topographical sketches or plans would indicate. Some consideration arose as to whether or not the house should be built with a projection, or L, at right angles with the main structure, or whether it should be built with a diagonal projection. You have heard the evidence in regard to that. The defendants contend that they allowed the plans to go on by reason of an assurance on the part of the plaintiffs as to the feasibility of the square or the projection at right angles, that they allowed them to go on by reason of the advice and assurance of the plaintiffs as to the cost and feasibility of it and were guided wholly by their judgment.

The plaintiffs continued in the execution of the plans; they procured the details and perfected the entire set of plans. For some reason those plans were rejected by the defendants. The plaintiffs say that it was because they did not give the house sufficient size and capacity and arrangement to suit them, and that they preferred an entirely different house, a house of different dimensions and different architectural proportions. The defendants say it was because they found the plans impracticable, and that the arrangement of the plans called for so great an outlay that it rendered it too expensive for them to be carried out and adopted, and they say that that was on account of the mistake of the plaintiffs in not properly advising them and in deceiving them as to the practicability of the plans.

Now, gentlemen, in determining the rights of the parties, it is well to consider what the legal duty of the plaintiffs was to the defendants. The architect is skilled in the art of building houses. Those who employ him have a right to his best judgment, to his skill, to his advice, to consultations with him and to his absolute fidelity and good faith, and when the architect has contributed these things to the person who employs him his duty has been fulfilled.

Now, in this case, if these plaintiffs, taking the description of the lot from the defendants, and believing it to be feasible and best to advise a house with a square L, and in good faith they did so, and the defendants accepted the advice and relying upon it, allowed the plans to go on and be finished to the minutest detail, then, gentlemen, the defendants have had a service for which they must pay. But, on the other hand, if the plaintiffs deceived the defendants, and did not give them good and faithful service and advice, but knowing and having knowledge sufficient to warn them that a house of that sort would be impracticable and too expensive to be built and withheld that information from the defendants and concealed it from them, and of their own desire and motive went on and built this house leaving the defendants to find it out when completed, then, gentlemen, they cannot recover.

So, then, the question comes as to the first charge, in this writ, of $150 for the plans and specifications for the first house. As the house

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was not built, it does not come within the schedule of prices contained in the slip that was handed to the defendants, and, therefore, it is left to the law to determine what the compensation shall be. And in such cases the law says that the compensation shall be a reasonable compensation. I do not know that the defendants deny that $150 would be a reasonable compensation for the services, if they are compelled to pay it. If the learned counsellor denies that fact he can say so now: but I do not understand that he denies the reasonableness of the charge, but rather that the charge is illegal and that they are not required to pay it at all. So, gentlemen, take that consideration, under the instruction which I have given you and say whether or not these plaintiffs, taking into account the information which was given them by the defendants, taking into account their instructions, taking into account the defendants' views about it, and say whether or not they served them faithfully, honestly, in the exercise of good judgment, without fraud or concealment, without any attempt to compel the defendants to pay for a set of plans and specifications for a house that they knew were impracticable, and could not be carried out without unreasonable expense, and if you find that the plaintiffs were faultless in that regard, if you find that they acted in good faith and gave the defendants their best advice as to construction, skill and service, the defendants having taken it and accepted it, why, then gentlemen, the defendants must pay them a reasonable compensation for their service, which is admitted to be $150, otherwise the defendants are required to pay them nothing. That is wholly a question for you to determine. The first plans and specifications were rejected some time in the month of April. I think that one of the defendants says that then he had a conversation with the plaintiffs about building him another house, and that they expressed a desire to do so, and I think he stated that he should be very glad to have them do so, and thereupon the plans and specifications for a second house were undertaken by the plaintiffs and carried forward to completion. After the plans were made, they were accepted by the defendants and appear to have been satisfactory to all parties, and the building was placed under contract with a builder whose duty it was to build and construct the house according to the plans and specifications. To this contract these plaintiffs are not parties. They are simply the servants of the defendants. They are required to give them their service, to follow their directions and do whatever they should direct to have done. The defendants might discharge them at any moment, or they might allow them to continue. The plaintiffs, not being parties to the contract between the builder and the defendants, are not held bound by that contract, except in a general way, except in particulars that may perhaps be material and which I will mention hereafter.

You will notice by the terms of the contract that, as fast as the work progressed, the bills were to be submitted to these plaintiffs, the architects, who were to approve them, and when they were approved they were payable, and I understand that they were promptly paid. I understand that the house was built and that the defendants paid for it — for every nail, scantling, board, brick and shingle; that they have paid for the painting and the decoration, and that it is their house. The plaintiffs in this case have contributed nothing except their personal services. The house was to be built upon the land of the defendants, and when the house was completed and they had paid for it — paid for the material and labor — it necessarily became their house and they could not reject it if there were faults on the part of the architects. They would not be required to do so, because it would be unreasonable to hold that, if the architects had failed to perform their contract faithfully, the defendants would be obliged to allow their house, costing upward of thirty thousand dollars, to remain idle and vacant until a law-suit could be determined. They were not required to do that, so they moved into the house, and the plaintiffs are entitled to recover the schedule price for their services in preparing the plans and specifications and in supervising or superintending the building of the house. The amounts charged are not denied to be the schedule prices for that work, including the bill for travelling expenses, so that you need have no trouble concerning the items of the plaintiffs' account. They are indivisible, and no special assessment is required by you touching them, except so far as deductions may, or may not, be made from them as required by the instructions which I am about to give you In the main the house seems to have been completed as the defendants had wished and intended; but the defendants say that the plaintiffs wilfully departed from their instructions, and wilfully built and finished it contrary to their explicit directions. In the first place, the defendants say that they directed the trimmings of the house to be of a particular color. The plaintiffs deny this. They say that it was indefinitely left to them to choose the color that would match certain other parts of the house, and give to it a proper artistic appearance.

Now, gentlemen, that is a question of fact. If the defendants specifically and explicitly directed the plaintiffs to paint the trimmings of the house a particular color, and the plaintiffs understood those directions, it was their duty to follow them. It is the owner and builder of a house who has the right to say what sort of a house will please him, and what sort of a house shall be built, so long as he is able and willing to pay the expense of building it. But the plaintiffs say that this was left indefinite and that they had no express instructions to put on the color which the defendants contend they had, and this the defendants deny. That, gentlemen, is a question of fact. Are you satisfied from the evidence that the defendants expressly ordered the plaintiffs to put a particular color upon the trimmings of that house, as they say they did, or, does the evidence fail to satisfy you of that fact? If you find that the plaintiffs had specific directions as to the color which should be put upon the house and, notwithstanding that, wilfully violated those directions to please themselves, because they thought a different color would be better, then gentlemen, the plaintiffs are in fault, and the defendants, having changed the color to suit themselves, and paid therefor the sum of seventy-five dollars, have a right to charge that against the plaintiffs' bill. So that, in regard to that matter, if you find that the paint was put on there in disobedience of the defendants' orders by the plaintiffs, then you may deduct from the amount the plaintiffs are entitled to receive, the cost of changing it. But, on the other hand, the plaintiffs may have had talk in regard to these colors, may have advised about it, may have held out various considerations and the defendants may have thought about it, and if the plaintiffs did not understand that they had specific and explicit directions, but that they had only received advice and suggestions, and they, in good faith, followed out their own best judgment about it, without wilfully violating the orders of the defendants, why then, gentlemen, even though the color did not please the defendants, it is no defence to this action, and they must fail so far as that part of the case is concerned.

In the next place, the defendants say that the plaintiffs constructed the sashes of the French windows in express violation of their orders and directions. Now, gentlemen, how was that? The plans definitely and distinctly show the kind of French windows that were to be built and furnished. You will have with you the plan. That shows that the windows originally put into the plan and into the blue-prints were exactly the same kind of French windows that were put into the house by the plaintiffs. I do not think that either party questions that fact. But the defendants say that after the plans were made, and while one of the plaintiffs was at Bar Harbor, they called his attention to certain sashes in another house and directed him to have their sashes made like those shown. The plaintiffs say they do not remember any conversation of that sort; but they may have been asked as to whether the windows would be like those or not, but they do not remember definitely about it.

Now, gentlemen, the same considerations come in here that came into the other case. It is always well for the owner of a house, in matters of this sort, where the contract and specifications are in writing, to bear in mind that the architect, likely enough, has many jobs on his hands and many buildings under his control and is very likely to forget and omit specific directions, and if he wishes his architect to make changes, it is always well, if he wishes to give specific directions and to hold the architect to them, to give them in writing. The owner is not required to do so, but it is well that he should. This was not done in this case, and you will determine whether or not the plaintiffs, in following out the plans that had been given them and putting in the windows exactly as the plans and drawings required, violated the express orders and directions of the defendants, or whether, in good faith, they followed out what they supposed were his wishes and directions as expressed in the plans, and had not in mind any specific directions more than mere conversation or inquiry about it. It is just the same in this as in regard to the paint. Now, the testimony is (and I think it is undisputed), that for the changes made in those window-sashes the defendants paid $65 Well, gentlemen, if that was paid on account of the plaintiffs' wilful disregard of the defendants' orders, it may be deducted from the account. But if it was only required to be paid because the plaintiffs made a mistake about it and they built the windows in good faith, that was all that they were required to do, and if the defendants saw fit to change them afterwards, they must pay the expense of doing it.

Now, there are two other considerations which are of the same character, the dormer-windows and the dining-room. The blue-prints, or the original plans of the house, call for dormer-windows, apparently to be 2 feet 11½ inches from the floor. That plan the defendants had had and accepted, and they had reason to expect that the windows would be built at that height. The contract contains, in substance, a permission on the part of the defendants that the architects may make some changes, as they may think desirable, in the construction of the house, and, therefore, even though the blue-prints called for these windows to be built 2 feet 11½ inches apparently, yet in the absence of more specific instructions from the defendants, if they, in good faith, thought it advisable and best, in the exercise of their best judgment and discretion, to raise the window-sills seven inches and a half, and they did so, then, gentlemen, that would not prevent their recovery in this case. But if, on the other hand, they had received instructions to make the windows low, and, knowing of these instructions to make them low, they deliberately and purposely went to work and made them high for some particular reason of their own, then gentlemen, they violated their duty. You will take into consideration the probabilities of the case; you will take into consideration the motives which the plaintiffs would, or would not have, in doing a thing of that sort. In answer to an inquiry of mine, it was stated by one of the witnesses that there were no architectural reasons why the windows should be raised; that it was not necessary that they should be raised on account of any architectural defects. Consequently, if that was so, the plaintiffs would have no reason to raise them simply to give a better appearance to their own work.

Now, the plaintiffs say that, although the blue-prints call for the windows to be 2 feet 11½ inches, they received specific directions from the defendants to make the windows high, and that they thereupon, in making their frame plans, marked them up 7½ inches, and that the house was built with these windows 7½ inches higher than the original plans called for. Now, the defendants say that was done in direct and distinct violation of their orders. The plaintiffs say that it was not; that their instructions were to make the windows high. It is argued to you that they would have no motive in departing from the instructions, and it is argued to you that they exercised their own good judgment and good sense in determining where it was best to place those windows. On the other hand, the defendants say that they were told explicitly to make them low. Now, gentlemen, that is wholly a question of fact for you, and you will determine whether or not the plaintiffs deliberately and wilfully increased the height of those windows in violation of the defendants' instructions.

The dining-room was to be oval in shape. A controversy has arisen as to whether it was so built. The plans and specifications do not show what kind of a ceiling the dining room was to have. It is conceded by all parties that the room was to be broken upon the floor by a fireplace and chimney; they were to break the exact oval of the room. The plans show that. So far the intent of the parties is plain and easily to to be understood. Now, the defendants say that they expressly told the plaintiffs that the chimney-breasts should disappear at the lower point of the cornice in the room, so as to give them an oval ceiling, and that they required it made so. They say that that was their

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express and explicit direction to the plaintiffs. On the other hand, the plaintiffs say that it was suggested to them, or that they suggested it to him. I do not think it is of any consequence from what source the suggestion came. The plaintiffs say that, having that in mind, and either from the defendants' suggestion that they would like to have an oval ceiling, or from their suggestion to him that it would make a very handsome room if it could feasibly be done, they made studies and sketches; that they went so far even as to make sketches that were finally submitted or shown to the builder, to the contractor, but the plaintiffs say that those plans were never adopted by the defendants; that they were only shown to them to see how far the idea could be worked out, hoping to do it if possible; that finding it impracticable and feeling that the defendants would hold them responsible for having a chimney of a proper draught, and to avoid its smoking, they were unwilling to recommend it and to adopt it, and, therefore, they made the room as it is now made, by carrying the chimney straight upward. Now, gentlemen, if the contention of the plaintiffs is the true one, and they and the defendants considered the feasibility of making this room in that way; if they talked about it and had conferences about it and made sketches of it, and finally it was left to the discretion of the architects to determine and they did determine to build it as they did, they were justified in doing so. If, on the other hand, as the defendants contend, they had specific instructions to build it the other way, and to have the chimney disappear below the lower edge of the cornice, it was the duty of the plaintiffs to build it so. It was the defendants' house. They were willing to pay the bills, and they had the right to have the dining-room, or any other room, built in any way they were willing to pay for, and it was the duty of the plaintiffs to so build it. But if, on the other hand, from the conferences and the talk between them, the plaintiffs were led to believe that they had no express or positive orders to so build it, but were only required to build it if it met with their approval, if it became feasible and would, in their opinion, give good results, why then, gentlemen, if they saw fit to exercise their own judgment, and did so, in good faith, even though the defendants are displeased with it, it is no bar to the recovery of this case.

Now, gentlemen, the dormer-windows and the dining-room come under the same consideration, in one aspect, that the paint and the French windows do, except that in the first two instances, the defendants made the changes themselves and paid the bills. Now, in regard to these other two items, the dormer-windows and the dining-room, I instruct you, as matter of law, that if the plaintiffs, wilfully, disregarding the positive orders of the defendants, built the dormer-windows high when they were directed to build them low, and built the dining-room with a broken oval in the ceiling when they were directed to give it a perfect oval, and if the violation of those orders has substantially injured the elegance, comfort, utility and value of the house, then the plaintiff cannot recover at all, because a man cannot be allowed to wilfully disregard the orders and directions of his employer, and then compel his employer to pay for the service. But, on the other hand, if any of these deviations were honestly and fairly made and were not wilfully done in violation of the orders of the defendants, even though it did not come up to the contract, or to the directions of the defendants, then, gentlemen, all that the plaintiffs would be required to do in such case would be to make the defendants whole; and the defendants, for any shortcoming of that sort on the part of the plaintiffs, would be entitled to have deducted from the bill the difference in value between the house they have got and the house they would have had if the architects had performed their duty according to their directions and requests. So you see that that question turns explicitly and directly upon whether there was any failure on the part of the plaintiff to follow directions, and, if there was, whether it was wilfully and purposely done in direct violation and disregard of the defendants' orders. In the one case, as touching these two last items, it bars their recovery altogether, and in the case of the first two items, the paint and the French windows, it allows them to be deducted from the bill, because the changes have been made and it is ascertained exactly what the damages would be. But if there was no wilful violation on the part of the plaintiffs, and they carried out the defendants' directions to the best of their knowledge, with discretion and skill, in the construction of this house, even though they may not have conformed to all the directions and requirements of the defendants, yet they would not be barred from recovery of their bill, but could only have deducted from their bill the amount which the defendants had pecuniarily suffered, and which would be the difference between the house as now built and the value of the house as it would have been had it been otherwise built, or built according to the requirements.

Now, gentlemen, there is one other consideration. It appears that in the contract there was included a stable, and the plans and specifications were to cover the stable, and that some plans and specifications were furnished. It appears that a stable was built by the defendants, and the defendants contend that, inasmuch as certain framing plans or specifications concerning the stable were not furnished to them, which came within the duty of the plaintiffs to furnish and for which they had paid, and which were refused to the defendants, that the plaintiffs cannot maintain this action. Gentlemen, that is not the law. They can maintain their action; but it was their duty to furnish the framing plans and specifications touching the stable; it was their duty to do it; they were paid for doing it. Now it does not appear that any of the work was delayed, or that a stable was not allowed to be built on account of the non-receipt of any of those things. It appears that the plaintiffs' bill concerning the stable was paid by the defendants. So, gentlemen, in that regard, I instruct that the plaintiffs were bound, before they received their whole pay, to furnish all the necessary details and plans for the stable, and if they refused to furnish them, then, gentlemen, you must deduct from their bill such sum as you think, from the evidence, the plans so refused were reasonably worth. If, on the other hand, the defendants accepted the plans and did not call for the specifications, or waived them, and settled the bill, and made no claim on that account, and the settlement included all the controversy in regard to the stable, that is an end of the claim and you will not concern yourselves about making any deduction for their failure to furnish specifications in regard to the stable. Otherwise, you have the right to consider it, and to make such allowance as you think the plans that were so refused by the plaintiffs to have been reasonably worth. Now, gentlemen, if you find a verdict for the plaintiffs, you will add interest from the date of the writ. In regard to the rough-cast, that was left to the architects to decide, and their decision must be binding upon the defendants. It is not contended here that there was any such failure on the part of the plaintiffs in regard to the rough-cast as would change the result of this case.

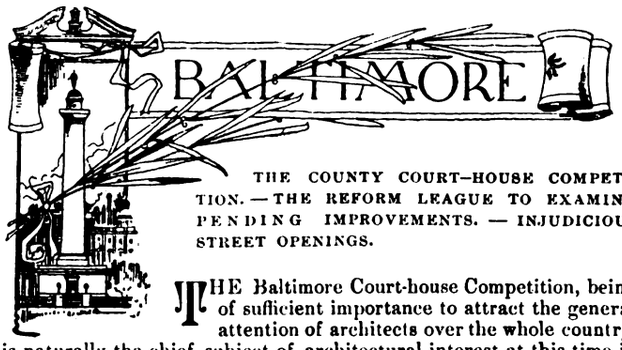
There are one or two things that have been suggested to me that I may have omitted, and that is in regard to the dormer-windows and the dining-room. I supposed I had stated to you (I will do so now at any rate) that if they were built by the architects, in the exercise of their own good judgment and discretion, and not in the wilful violation of orders, why, then the defendants have no claim on that account, if they were built as ordered.

Then, it is suggested to me that I told you that a plan was submitted to Mr. Hodgkins for consideration by him. I do not know that I said so, but if I did so state, you have heard the evidence as to what the plan was submitted to him for. I did not mean to preclude you in any way about that, and I do not know as it is material. I did not intend to say to you that the plan was submitted to him to determine anything, because I do not know that it was.

I am requested by the learned counsel for the defendant to instruct you that,

"If you find that the house was not built in accordance with the defendants' instructions to the plaintiff, and such departure was the result either of the negligence or wilfulness of the plaintiffs, then there shall be deducted from the amount that would otherwise be due the plaintiff whatever damage the defendants have suffered on account of the departure."

Yes, gentlemen, I give you that instruction.



THE COUNTY COURT-HOUSE COMPETITION. — THE REFORM LEAGUE TO EXAMINE PENDING IMPROVEMENTS. — INJUDICIOUS STREET OPENINGS.

THE Baltimore Court-house Competition, being of sufficient importance to attract the general attention of architects over the whole country, is naturally the chief subject of architectural interest at this time in the city itself, as it is by far the most extensive, elaborate and thoroughly considered scheme ever yet instituted in Baltimore, and, indeed, may rank as one among the most important undertaken in any of our larger cities during the last decade. The pamphlet of instructions to architects, issued about three months ago, is carefully, systematically and, on the whole, successfully compiled by an unpaid commission of eight prominent citizens, with the mayor as chairman, and Prof. W. R. Ware as expert advisor, and it is evidently the intention of this commission to act to the best of their ability in order to accomplish the best results for the city under the fairest terms to the competitors. They err, perhaps, in being too explicit and binding in what they ask for, as to the exact dimensions and other points, even of the subordinate features, of what they have preconceived as a proper arrangement for such a design. In addition to the quite minute and exhaustive details of site and of the various requirements throughout the entire building, representing in itself no small amount of labor and expenditure of thought and time, the remainder of the pamphlet is chiefly occupied by the few simple conditions of the competition, very fairly conceived and clearly stated.

No limit of cost is named; it is, however, generally known that $1,400,000 have already been appropriated for the purpose, and that an effort is being made, apparently meeting with public approval, to obtain $1,000,000 additional. Not more than ten sheets of drawings are required, to a sixteenth-inch scale, finished only in line and black-and-white, with a perspective of the same character to an eighth-inch scale, and all designs were to be submitted, under number only, not later than April ninth. Five from among the most prominent architects in the country outside of Baltimore — Messrs. McKim, Mead & White, Peabody & Stearns, Burnham & Atwood, Carrère & Hastings and Bruce Price — were especially invited to submit designs, for which they will each be paid $400. The same amount is also to be paid to each of the best five designs received from Baltimore offices. All other architects are invited to compete under the same instructions and regulations, but without remuneration, and the expert advisor will select, at least, five from all designs received and hand them over to the Commission, with comments and recommendations, and the Commission will then appoint the author of one of these designs to be the architect of the building, if in their judgment and that of their advisor they are justified in so doing (a very elastic condition), with a compensation of five per centum on the total cost.

This is undoubtedly an admirably-arranged competition and one with which, in all its general conditions, the profession should feel thoroughly satisfied. Some comment and discussion arose among some of the local men in regard to the position of the Baltimore

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architects in the competition, it being claimed that a certain number of them should have been selected by invitation and their designs paid for, as was done in the case of the five invited outside men, but the Commission, for various reasons, preferred not to make any standard for selection among the Baltimore men, but to leave the question of the premiation of these to the best five designs submitted, chosen on their merits alone, without regard to authorship. It was even suggested that a money-value basis be taken and only those men invited to compete who had done work costing over a certain amount. For obvious reasons this suggestion did not commend itself to the Commission and they determined to abide by the original form of their "Instructions," addressing, however, a letter to each of the Baltimore architects, specially inviting them to submit drawings under the regulations therein contained. It is needless to say that no designs are to be shown outside the Commission, unless by permission of the respective authors, to whom all the drawings are to be returned when the competition shall be decided.

The excellent form this competition has so far taken, where the execution of the work and the full amount of five per centum on the total cost is to be given to the successful competitor, the conspicuous position of the site in the centre of the city and a certain amount of general public interest and discussion that the matter has excited, has proved, we feel, a decided step in architectural progress, not only in this particular community, but will have influence, perhaps, extending beyond.

Another step has been made in the last few days in the right direction toward obtaining the recognition and influence of intelligent public opinion in regard to matters that bear directly on municipal reform of various kinds, all of which are at present of the greatest importance to the city, and which, more or less directly, must have an effect on architectural questions. The Reform League of Baltimore, consisting largely of men of integrity and influence outside the political ring, at its last meeting, among other measures, appointed several committees from among its members to definitely overlook and report upon certain specific items of city work, already in hand or to be undertaken, such as sanitation, paving, sewerage and street-opening. To architecture, none is of more importance than the last, namely the opening and widening of streets, of which of late much has been done recklessly with very disastrous results. In some few cases what has been done was doubtless desirable, or even necessary, if properly carried out with the careful forethought and consideration which such changes usually require, but in the majority of instances, from the demands of rapid-transit companies, or of interested property-owners with an influence in city politics, and such like moving forces, a number of the most uncalled-for and positively injurious "openings" and "widenings" have been made, at large expense to the city's treasury, relieving no really "congested" sections, extending no really important thoroughfares, tearing out fairly good existing buildings, to be replaced by few better, many worse, or else leaving ghastly propped-up ruins, hasty and cheap repairs, and vacant lots covered with débris, the portions of the city where the changes have been made apparently not demanding any improved building over what previously existed there. Still more unfortunate is the totally haphazard way in which the lines of these newly opened streets have been allowed to run into each other, it being scarcely conceivable that those responsible could be either so ignorant as not to see the defects, or so indifferent as to willingly permit them, or, indeed, so presumptuous as to undertake such public work without carefully considered professional advice from the best authority. It is conspicuously evident in many cases to the most casual observer how absolutely wrongly the thing has been done, and how much better, and simpler, and more natural and more effective several other arrangements would have been that suggest themselves to any one with an eye for form and symmetry, and general order and propriety. This is painfully apparent at the Piazza of Mt. Royal Avenue in front of the new Music Hall.

The possibilities here were exceptional for a fine, monumental effect of open "place," avenues and good city architecture, with only a careful, judicious study of the natural situation and requirements, and such small extra expenditure as would have been duly repaid by the enhanced value of all surrounding property. The short-sightedness that did not avail of this opportunity to give to Baltimore one of its few possible good architectural points in its new streets is criminal, whether resulting from ignorance or indifference, and no amount of erroneously colored description and praise can cover the fact that what might have been really a fine result is nothing but an irregular, contorted open space, of no form whatever, surrounded by railroad-stations, badly paved streets of poor buildings, both old and new, and an unfinished Music Hall without a façade, which, even in its embryonic condition, looks out of place — evidently dropped into its position and still seeking a "local habitation" and an axis, with some sort of an excuse for being there at all.

As unfortunate as these late "improvements" are, there are others, not yet undertaken, but which would evidently be so desirable at different parts of the city in the very same line of street opening and widening, yet we tremble to suggest them and would "rather bear the ills we have." It is earnestly to be hoped that the committees from the Reform League will become a power and exert an influence, both restrictive and creative.

PUZZLE BUILDINGS.

INNUMERABLE are the structures to which this title applies, if it be understood to mean buildings of which the record is lost. Stone circles, cyclopean walls, the *cloacæ* of Rome, the "mounds" of western America, and countless others are as puzzling as could be. We would limit the term, therefore, to elaborate edifices, the mere use or design of which is unintelligible. Even then, very few examples out of a multitude can be dealt with in our space.

The Noraghe of Sardinia, perhaps, have exercised human ingenuity upon a greater scale, for a longer time, than any other structures on earth, says the London *Standard*. Greeks and Romans speculated over them, and learned men of all countries are speculating still. Aristotle mentions them with admiration; so does Pausanias. They are, in brief, towers standing on an artificial mound, 30 to 60 feet high, and 100 to 300 feet in circumference at the base; some which have a lower platform are more than double this latter dimension. The material is stone, regularly worked with the hammer; they show neither sculpture nor inscriptions nor cement. Some of the blocks are immense. A very low entrance, but broad, leads by a gentle incline into a passage of good height, communicating — by another very low doorway — with a domed chamber, 15 to 20 feet in diameter, and 20 to 25 feet high. Small holes on either hand betray the existence of two or four cells, cut in the thickness of the wall, several feet in width and depth and height. From this dome a spiral passage, rising steeply, takes one to another just above, somewhat smaller, and on again to the broken top of the Noraghe — for none is entire.

What can we make of buildings like these? More than three thousand have been counted. Some authorities argue that they were tombs, some trophies of victory, some fire-temples, some observatories, some even houses. It is easy to show that several of these explanations will not serve, but one cannot possibly tell what forms of building religion may command. On that account only, it may be supposed that the Noraghe were temples or giant altars for sacrifice. Nothing has been found in them. But other remains, not less puzzling, are generally found close by, and — be it remarked — nowhere else. These are "Sepultre de is Gigantis" (giants' graves). Low walls of rough stones enclose a parallelogram, sometimes forty feet long and six feet broad, paved with enormous slabs. They always lie northwest to southeast, and at the latter angle stands a "headstone," a single block not less than ten feet high, often fifteen. Behind this, away from the "grave," the walls are prolonged to make the segment of a circle. At the foot of the headstone is a square aperture finely cut. Of these extraordinary objects many hundreds remain. They represent prodigious labor and no little skill in mechanics; but all that research or ingenuity has discovered is, as yet, that nobody was buried in them.

We have a variety of puzzle buildings in this country [England]. The term may be applied to the "denes" of Essex and Middlesex — perpendicular shafts sunk in the earth, with lateral chambers at the bottom. The most ingenious antiquaries have not yet shown who dug these extraordinary caves, nor what was their purpose. But it is evident that they might serve either as granaries, or dwellings, or places of refuge in time of trouble; all these theories have been argued. Therefore, the denes and other such unexplained but not inexplicable mysteries may be put aside — the Martello Towers, for example. Things downright unaccountable remain. The most speculative only venture to suggest that such or such may have been the object in building the "raths" of Kerry. Hundreds of these raths are still untouched, hundreds have been explored, and hundreds, at least, destroyed. They are apparently mounds of earth overgrown with grass, perhaps twenty feet high and sixty feet in diameter. When the turf is removed, we see an outer wall of stone encircling the space, supporting generally a roof of large slabs; but sometimes the substructure is sunk in the ground, when the slabs do not appear to form a roof, but a pavement.

Somewhere in this wall is the entrance, a narrow hole upon the level of the earth. Crawling through it — but mindful of the poisonous gases which accumulate under such conditions — we find that the enclosed space is intersected by walls which split it up into chambers — not less than six — ten to twelve feet long, and four and a half to five feet high. They all communicate with one another by holes just large enough for a man to crawl through; but the archway is hewn stone excellently fashioned. Each chamber has an outlet for ventilation in the surrounding wall. Sometimes there is a rude fireplace in that most distant from the entrance, though it remains to be discovered — a minor puzzle — how the occupants escaped suffocation when the fire was lit. The floor of a rath is always dry — for a spot with natural drainage was chosen. There is nothing more to be said about them. No tool nor bone has ever been found, excepting objects evidently introduced at a modern date. What can be the purpose of these buildings? They were not meant as hiding-places, for the rath always stands conspicuous. They were not in the way of forts, since an enemy had but to close the ventilators and all within must stifle. If they were dwellings, the people who used them must surely have been dwarfs, for the shortest men of European race could not stand upright therein. It has been suggested that they were the cellars of a small village or communal house, built upon the roof, of perishable materials; but in that stage of civilization, cellars are quite unnecessary. We must give it up — for the present, at any rate.

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Let us turn to Japan. Cave dwellings of elaborate construction have been familiarly known and used in many districts from time immemorial. Of late much attention has been paid to them. Mr. Shogoro Tsuboi published a striking account of his discoveries in the *Asiatic Quarterly Review* some years ago. He removed the earth from a hillside, near Tokyo, where a few caverns were visible, and found it actually honeycombed with them. No less than 237 were explored. They are hollowed in tufaceous sandstone after a style of architecture always the same. Mr. Tsuboi does not give the height or width of the entrance, but since he mentions that it was necessary to walk "with our bodies bent," the aperture must be low. It is carefully shaped. A few feet within, the passage widens, forming a chamber one metre square; grooves in the walls, the roof, and sometimes the pavement suggest that a slab of stone here or some sort of door shut off communication. But how could this be? The living-room beyond had neither light nor air, for it is cut in the solid rock.

This living-room, so to call it, is always square and domed. It has an area generally of six to nine feet, and the top of the dome "is little less than six feet from the floor." Here again a race of dwarfs is suggested. We do not learn at what height the domed roof springs from the walls, but it would be very awkward if the males of the family could stand upright only in the middle of their parlor. Moreover, there are holes, sometimes four to four and a half feet above the pavement, which look as if they were designed to receive joists for a ceiling. Shelves and cavities are hollowed in the walls. Every chamber has a bed place — the larger, two or three; that is, a divan, six inches high or so, and six feet long, which is so described. Channels in the pavement served for drainage. Many of these caves are so close together that the partition-walls are barely a foot thick, but in only three instances has any communication been observed; and one of them was clearly accidental, though the smoothness of the sides displays that advantage was taken of the accident. We have here the dim suggestion of a romance, for the builders evidently did not desire that their families should hold intercourse with one another inside the cave. As for the contents, very many objects were discovered, some of vast antiquity; but all of the historic time, left doubtless by people who used these dwellings before they were buried. Mr. Tsuboi found even a series of marks, which we must believe are inscriptions; but they have no resemblance to the Japanese or the Chinese alphabet. All is mystery.

EXPLORATIONS IN CRETE.

At a meeting of the New York Society of the Archæological Institute, held at Columbia College on Thursday, April 19, President Merriam made a report upon recent explorations in Crete, and showed some photographs just received. The report was, in substance, as follows:

The island of Crete has long been a coveted field to archæologists. Situated between Greece and the Orient, it lies in the natural track of commerce and civilization in their eastward and westward flow, and it is believed that its soil hides the answer to many of the problems of early culture and art. Tradition points to it as the seat of the earliest maritime power known in Greek waters, and the laws of Minos and Rhadamanthus were proverbial as the fountain-head of Greek legal lore. Even the Spartans believed that Lycurgus drew inspiration from this source in moulding his institutions, and they certainly owed much to the Cretan poet and musician, Thaletes, in the seventh century, B. C. The ancients began their history of Greek sculpture with the advent of the Cretan artists, Dipœnus and Scyllis, in the Peloponnesus, for they were the founders of a new school and the beginners of a new era in historic art. Other sculptors from the same island appear about the same time in Greece and Asia Minor, stirring a new impulse wherever they went, and exhibiting the vigor with which the arts must have been practised then in the island. Nor was the art of the earlier period wanting there. Objects of the pre-historic, Mycenæan time have been found, and others of the later transition era, with their strong tinge of Oriental influences, have been discovered in the famous grotto of Idæan Zeus. Some of the most ancient forms of the alphabetic signs, too, very closely connected with the Phœnician, exhibit the affiliations which were expected. Indeed, everything known of the island indicates its importance to the archæologist, and leads him to hope for its early exploration. Schliemann tried it and failed, and other European archæologists and archæological schools have been repulsed. One of the first projects of our Institute after its foundation was exploration there, but the plan was not realized. The only person who has really achieved success within its bounds is Prof. Federico Halbherr of the University of Rome, who spent some three or four years there about a decade since. He it was who discovered the great Gortyna inscription, which within the past few months has become the subject of newspaper exaggeration abroad, till it has reached the dignity of myth, in which it is designated as containing the laws of Minos and Rhadamanthus. It is indeed a singularly antique and important code of laws, and has been the favorite browsing ground of the philologist, the antiquarian and the student of comparative law for some years. Numerous additional archaic inscriptions, together with the important objects from the Idæan grotto, rewarded the zealous and well-directed search of Dr. Halbherr. With such experience, with such a knowledge of the territory and the people, intimately affiliated with the Syllogos or Archæological Society of the island, he is naturally most competent to pursue investigations in a district whose political relations have for a long time been most unsatisfactory and often most dangerous.

With a Greek population ardently desirous of annexation to Greece and embittered by numerous uprisings, repressed with a merciless hand by the Turks, and with a large Turkish element, domineering and cruel, the state of the island is far from tranquil, and the path of the foreigner is strewn with thorns. But Dr. Halbherr was not daunted. His archæological zeal has made him always ready to return to the scene of his former labors, and last summer he accepted an offer from our Institute to spend the winter in Crete and explore the country again. He arrived at Candia about the first of November, and began his efforts to carry out his plans already formed. He found the political condition of the island completely changed since he was there before. The last revolution in 1889, which was favorable to the Turks, resulted in banishing the Greek element from power and influence. The national assembly exists no longer, and the island is assimilated to a Turkish province of Asia Minor administered directly by the Porte, the governor being sent from Constantinople. Under these circumstances it has been much more difficult than formerly to carry out his plans, but he has already succeeded in accomplishing much. He has explored a large part of the eastern half of the island, and the yield of inscriptions has been considerable. The most important is an imperial rescript, one of the longest Latin inscriptions of the Levant. Another is in archaic Greek and belongs to an unknown city. It records a hitherto unknown Cretan magistracy, that of the *Ephoroi*, so familiar in Spartan regions. Among sculptured objects are to be mentioned four heads of members of the family of Augustus, a head of Commodus, a Hellenistic head of Hera, and a colossal statue of a *Cosmos* or other personage of Macedonian or Roman epoch. Another important work has engaged the attention of Dr. Halbherr. Acting in conjunction with the Cretan Syllogos, he has attempted to secure the preservation of the wall upon which the great inscription of Gortyna is engraved, by its purchase and removal to the museum at Candia. The agreement had been made with the owners of the property and the compensation had been arranged, but the removal involved the divergence of a stream from its present channel. To this the adjacent proprietors objected so strenuously and vigorously that the project was suspended for a time, and political and other complications have added to the difficulties. The hope of ultimate success, however, was not abandoned at last accounts.

This report was followed by an animated discussion upon the question of types in art, participated in by Mr. Sturgis, Miss Margaret Uhl, Professor Tisdall, Dr. J. P. Peters and President Merriam. Dr. Peters also gave an account of an interesting discovery in Babylonia, which confirmed Herodotus.

BOOKS AND PAPERS.

If there is any portion of France that English-speaking people know better than other parts, it is Normandy; possibly because English-speaking people have a certain blood-relationship with Normans and so feel more or less as if visiting the homes of their forefathers when they take a trip into Normandy, partly, of course, because of mere propinquity, because it is so near to England itself, usually the first stepping-stone as Normandy is the second for American travellers. But the chief reason lies in the abstract merits of the district itself, in its picturesque landscape features, and still more in the wealth, dignity and beauty of its architecture.

The outward aspect of this delightful country is just now being worthily presented to the cultivated book-buyer in a most sumptuous publication which makes the pangs of poverty all the harder to bear, and the temptation is so great that there will be many found who will not stop to consider that the plebian "one dollar per Part" will develop into the aristocratic two-hundred-dollar publication before the subscriber is released from his obligation. But, all the same, he will by that time have acquired a book well worth the money and one which he will always cherish. Moreover, he can divide his responsibility by limiting his subscription to the Parts, which will treat of one or more of the five Departments into which the old Province is divided, each of such Parts being a complete publication in itself.

The work is of quarto size, handsomely printed and illustrated, each complete volume, by from eighty to one hundred large heliogravures and a multitude of half-tone cuts and sketches in the text: thus the volume illustrating Seine-Inferieure is illustrated by ninety-one full-page plates and 476 pages of text, the price of which unbound, exclusive of carriage, is 200 francs. We should be glad to procure the work for any subscriber.

[1] "*La Normandie Monumentale et Pitoresque.*" Edifices publics, Eglises, Châteaux, Manoirs, etc. Texte par une Société d' Archéologues et de Litterateurs. Semale & Cie, Imprimeurs-Editeurs, Havre.

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MRS. ROBERTS has translated — in the main very well translated — and published, apparently at her own cost, a curious little work which, some thirty years ago, Victor Cherbuliez sent out into the world of letters under the title "*Un Cheval de Phidias.*"[1] The book is sufficiently interesting to read as a story merely, while it has enough of erudition and logical art criticism in it to satisfy those who seek for the deeper meanings that lie behind accomplished physical facts. The story concerns a certain charming countess who in spite of her fascinations is a devout blue-stocking, who in her wanderings has settled for a while at Athens with her uncle, her doctor, her confessor and a few acknowledged or unacknowledged aspirants for her hand. At Athens she divides her time between exercise in the saddle and the admiring study of one of the horsemen in the Panathenaic Procession, and at length takes advantage of a morning's picnic on the Acropolis to demand of her friends and attendants their explanation of the genesis of the fragment she admires. One responds with a great amount of information enforced by copious quotations from Greek and Arabic authorities. Another, an aspirant, whose fad it is to ride an unsaddled horse in absolute imitation of the method followed by the ancients, naturally has encomiums to bestow on the grace of seat assured by such method, and derision to shower on the mediæval and modern method where a rider depends so much on his stirrups, incidentally throwing much ridicule on the statue of Colleoni at Venice and the impossible gait the sculptor has given to the horse. And in this way with a little learning, a little philosophy, a little mysticism, a little common-sense and some good and pertinent suggestive criticism, the writer and translator have produced a book with which one can pass a pleasant and not unprofitable evening.

IT may be, perhaps, taken as rather a significant indication of the interest taken in steel-skeleton construction by all classes connected with building-operations, that Mr. W. H. Birkmire's book "*Skeleton Construction in Building*" has already entered on its second edition.

ALTHOUGH there is very little in the book of real practical value to architects, it is, nevertheless, a pleasure to find a manual of instruction in any industry prepared, arranged, illustrated and printed in as workmanlike a manner as the "*Art of Coppersmithing,*"[2] which presents in book-form a series of papers on the subject written by John Fuller, Sr., of Seneca, Kansas, and lately published in the *Metal Worker*.

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

ENTRANCE TO THE CHURCH MISSIONS HOUSE, FOURTH AVE., NEW YORK, N. Y. MR. R. W. GIBSON AND E. J. N. STENT, ASSOCIATED ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print issued with the International and Imperial Editions only.]

THE sculptured groups in the pediment panels are the work of the sculptor J. Massey Rhind.

MAUSOLEUM AT ROCK CREEK CEMETERY, WASHINGTON, D. C. MR. W. J. MARSH, ARCHITECT, WASHINGTON, D. C.

[Issued with the International and Imperial Editions only.]

THIS hillside mausoleum, recently completed for Mr. Crosby S. Noyes, is built of Quincy granite. The cost was $5,000.

DINING-ROOM FURNITURE FOR MONROE SMITH, ESQ., PHILADELPHIA, PA. MR. W. L. PRICE, ARCHITECT, PHILADELPHIA, PA.

[Issued with the International and Imperial Editions only.]

THIS furniture is now being made of dark English oak, and the upholstering will be in illuminated leather.

HOUSE OF CHARLES E. HIRES, ESQ., DEVON, PA. MR. W. L. PRICE, ARCHITECT, PHILADELPHIA, PA.

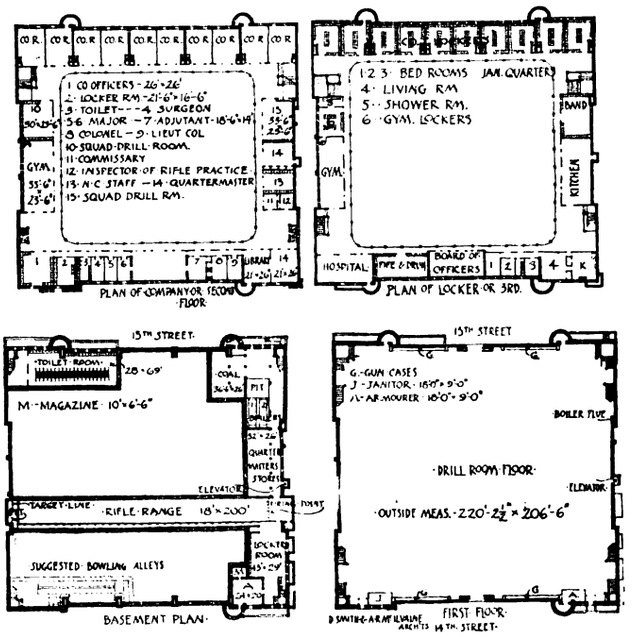
THE lower story of this building is to be of light gray stone while the upper story is of half-timber work, the brick panels being plastered and the woodwork stained a dark color.

HOUSE FOR E. H. CURTIS, ESQ., KENNEBUNKPORT, ME. MR. WM. L. WELTON, ARCHITECT, LYNN, MASS.

THIS house to be of regular smooth face ashlar for first story and shingles and half-timbered work on the second story; shingles and half-timbered work to be stained a silver-gray. Roof painted a brownish-red. Interior finish for first floor, live-oak; second floor, except bath-room, maple finished natural.

APARTMENT-HOUSE, MINNEAPOLIS, MINN. MR. H. W. JONES, ARCHITECT, MINNEAPOLIS, MINN.

COMPETITIVE DESIGN FOR THE 9TH REGIMENT, N. Y. S. G., NEW YORK, N. Y. MESSRS. DOUGLAS SMYTH & A. R. MCILVAINE, ARCHITECTS, NEW YORK, N. Y.



ST. PETER'S, ROME, ITALY: FROM THE REAR.

[Additional Illustrations in the International Edition.]

CHAMBER IN HOUSE OF E. F. SEARLES, ESQ., GREAT BARRINGTON, MASS.

[Copper-plate Etching.]

INTERIOR OF FRENCH PROTESTANT CHURCH, SOHO SQUARE, LONDON, ENG. MR. ASTON WEBB, ARCHITECT.

SOUTH END OF THE SAME.

EXHIBITIONS

BOSTON, MASS. — *Several hundred Specimens of Textile Designs of all countries, from the second century to the present time, from the collection given by Denman W. Ross; also a collection of Japanese Color-prints:* at the Museum of Fine Arts.

Architectural Drawings by Albert Randolph Ross: at the St. Botolph Club, May 7 to May 19.

CHICAGO, ILL. — *Annual Exhibition of Water-colors:* at the Art Institute, May 6 to May 27.

Seventh Annual Exhibition of the Chicago Architectural Sketch Club: at the Art Institute, May 10 to May 24.

NEW YORK, N. Y. — *Twenty-sixth Annual Spring Exhibition:* at the Metropolitan Museum of Art, opened May 8.

Exhibition of the Competitive Designs for the Decoration of the Oyer and Terminer Court-room: at the Century Club.

NOTES AND CLIPPINGS

TAKEN AT HIS WORD. — To show how few and simple words may constitute a binding legal contract, the *Australasian Builder* tells the following amusing story: An architect under cross-examination in the witness-box averred most positively that he could build a house according to the designs exhibited in court for what appeared to be a very inadequate sum — let us say £2,000. "You are quite sure," said the presiding Judge, "that you can build the house properly for that sum, within a reasonable time — in fact, you are ready to do so?" "Perfectly, your Lordship" "And you would undertake that there should be no extras?" "Certainly, my Lord." "Very well," said the Judge, "that is precisely the kind of house I want myself; on the rising of the Court, I will give you a cheque for the amount; build the house, and let me know when it is ready!"

[1] "*The Phidian Horse.*" Art and Archæology on the Acropolis, with seven illustrations. From the French of Victor Cherbuliez, translated by Elizabeth Hill Bissell Roberts; 1893. The Rittenhouse, Philadelphia.

[2] "*Art of Coppersmithing.*" A practical treatise on working sheet-copper into all forms. By John Fuller, Sr. Published by David Williams, New York, N. Y., 1894. Price, $3.

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The Liability of German Employers. — In Germany the liability of employers for accidents to workmen rests chiefly on the law of insurance which dates from 1884. All employers are obliged to insure their work-people and clerical staff, even when the employment is temporary and unpaid. There are special associations for different industries, and the statutes must be approved by the Imperial Insurance Office. Injuries include those which are internal as well as external, loss of intellect, memory, or nerve. When compensation is claimed, it is necessary to trace the injury to some specific cause, and not to the mere normal exercise of the occupation. Generally, the person who is to gain or lose most by the undertaking is held to be the employer. Thus, in building contracts, it is not the capitalist who advances the funds, but the master-builders, carpenters, etc., who are responsible. Employers' contributions to the associations are proportionate to their annual expenditure in wages. The amount of compensation is based on the wages received by the workmen during a year. So long as he is completely incapacitated, he is to be allowed two-thirds of his wages. For partial disablement he obtains a fraction of that maximum proportionate to the extent of the injury. In case of death, twenty days' payment (in no case a sum less than 30 marks) are to be granted toward funeral expenses. The widow, until her re-marriage, is allowed about twenty per cent of her husband's wages, whilst fifteen per cent is allowed for every child under fifteen who has lost one parent, and twenty per cent if it has lost both. The total compensation to widow and children must not exceed sixty per cent of the deceased's wages. In case of re-marriage, she receives as composition three times the amount of her annual allowance. If the deceased was the sole support of parents or grand-parents, they may receive twenty per cent of his wages during their lifetime. — *The Architect.*

Alma-Tadema's House. — In an article on Alma-Tadema, in the February *Century*, Mrs. Edmund Gosse thus describes the destruction of the artist's house and its rebuilding: By the year 1874, the decorations of Mr. Alma-Tadema's house, at the North Gate, Regent's Park, were completed, and the whole effect was of a palace of exotic beauty. In a moment all this beauty was well nigh destroyed by the explosion of a barge laden with gunpowder and benzoline, which was passing along the canal in front of his house. The walls were cracked, the windows broken, the front door, even, was torn off its hinges, so that the open portal showed on its threshhold the almost too hospitable greeting of "Salve" to the outside world. M. Tissot, the French artist, who was at the time living in London, said that the terrace of houses nearest to the scene of the accident had all the appearances of the streets of Paris after the bombardment during the Commune. There is a pretty story of the behavior on this occasion of the two young daughters of the house. They had always been told that if they felt frightened at night they were to ring their bedroom bell; so, when they awoke suddenly in the utter darkness, to find the window-frame lying on their bed, the ceiling falling in fragments, and hundreds of hazelnuts — part of the boat's cargo — showering down upon them, the elder child remarked to her sister, in the high calm voice of authority, "Anna, ring the bell!" The news of the explosion was a terrible blow to Mr. and Mrs. Alma-Tadema, who were travelling in Scotland at the time. But Mr. Alma-Tadema's splendid energy was equal to the occasion, and he at once saw means for improving his house. The outer walls were, first of all, firmly clamped together with huge iron girders; next, the inner house was considered. New doorways were cut through the side walls, arches were contructed, and here and there a slim, supporting column was added. The whole aspect of the place became, if possible, more charming and fairy-like than before. The artist decorated the ceiling of his studio in the Pompeiian style, with figures of his own hand in a design of light floral festoons, dividing the space into panels of different sizes and shapes. For these Mr. Alma-Tadema made some charming sketches of dancing nymphs and tootling satyrs.

The Carrara Quarries. — The marble quarries, which are 400 or 500 in number, are situated far above the town, in the midst of the grandest and most savage scenery. The soft aerial hues which distance lends to the mountains disappear on nearer approach. The great peaks stand up against the sky in fantastic forms. No trees or verdure clothe their naked sides, no flowers grow, no water flows to fertilize that soil. The 6,000 quarrymen who are busy here appear as ants crawling on the vast hillsides. The marble is quarried by dynamite. Every moment explosions rend the air, and huge fragments fly up as if expelled from a volcano. Often the mine has to be placed in the perpendicular face of a precipice. Then the workman is lowered by a rope and hangs suspended, "like the samphire-gatherer, 'twixt earth and heaven. A dreadful trade." About 160,000 tons of marble are annually exported, of which much goes to America. The quantity is inexhaustible. The entire mass of the Monte Sagro, 5,600 feet high, which dominates Carrara, is solid marble. One of the most famous quarries is in the valley of the Polraccio. From this were extracted in Roman times the 1,700 tons of marble that served for the construction of Trojan's column at Rome. Here Donatello got the block which he carved into his "St. George," and Michael Angelo the one for his "Moses." From here also came the huge block mentioned in the memoirs of Benvenuto Cellini, which served for the colossal Neptune of Ammanati in the middle of the fountain of the Piazza della Signoria at Florence. Unlike the miner, who burrows underground, he works in a blinding glare of light. The fierce heat of the Italian sun beats upon him in summer. The cold blast of the tramontana, rushing from the gorges of the Apenines, chills him in winter. Constantly exposed to danger, seeing his companions killed and wounded by his side, trained to rapid action, and with every faculty of mind and body on the alert, accustomed to dominate the rude forces of nature — he has developed into an independent and powerful type of man. — *English Illustrated Magazine.*

The Bessemer-steel Race between England and this Country. — For a number of years Great Britain and the United States were running a race in the manufacture of Bessemer steel, which eventuated, in 1879, in the supremacy of the United States, says the *London Engineering Review* At that time, however, neither country produced a million tons of ingots in a year. Until 1885 there was not much difference in the annual make of the two countries. The United States kept the lead which it won in 1879, although never by as much as half a million tons a year. But in 1886 the American Bessemer-steel industry took one of those remarkable spurts which have every now and again occurred in all the industrial enterprises of that country, and shot ahead of the British industry by about a million tons. In the following year it further improved this lead by about a quarter of a million tons more, and in 1890 it had the satisfaction of producing more than twice the Bessemer-steel tonnage of the old country. In 1892, however, the United States did relatively still better, and produced the extraordinary quantity of 4,168,000 tons of ingots, against a production of only 1,500,000 tons for the United Kingdom. From this giddy height the Bessemer-steel industry fell in 1893 to an output of only three and one-ninth million tons, while the British make of the same description of steel was practically the same as it had been in the previous year, notwithstanding that several of the leading works, notably in South Wales, were practically closed over the whole period. The moral of this short, eventful history is that great spurts, like those to which American industry appears to be especially subject, are liable to bring in their train equally great depressions, and that the best and safest thing for manufacturers is to aim at a regular and steady trade. Of course, the most serious cause of the over-production that is mainly responsible for the recent trouble in the United States is the enormous development of the means of production, not so much by the increase of new works as by driving to their utmost endurance the means employed in handling the materials.

A Birmingham Experiment in Street-watering. — "The very methodical manner in which you sprinkle your streets in St. Louis," said Wallace Orthwein, of Birmingham, Eng., who is on his way across the continent and was at the Southern yesterday, "reminds me of a very amusing incident in our city which resulted in something like a riot or rebellion ten or twelve years ago. A genius devised a plan of street-sprinkling by means of pipes laid in a recess cut between the stone sidewalk and the curb. This pipe was pierced with holes pointing in the direction of the street, and was then carefully cemented over, the holes, of course, being left clear. Then, when pressure from the main was turned on, water would shoot out of these little jets half way across the street, meeting the flow from the other side and sprinkling the street very thoroughly. The only drawback was, there were no means of notifying the public when the water was going to be turned on, and while the experiments were being tried, a man who was walking along the gutter was suddenly deluged with water, and drenched through and and through. He was arrested for assaulting one of the workmen who was watching the performance, but was discharged on the ground that there was at least some justification for this erratic vengeance. When the sprinkling device was in regular use it would frequently happen that whole bevies of ladies would be caught in the centre of the street and be held prisoners between two quite violent streams of water. Horses would stand on their hind legs and everything was turned upside down. I think the experiment was tried for about a month, but perhaps it was a little less. Finally, in response to a wail of indignation, which extended from suburb to suburb, the plan was abandoned, though it was not till some years later, when a new sidewalk was laid, that the greviously-offending pipes were taken out and sold for old iron. — *St. Louis Globe-Democrat.*

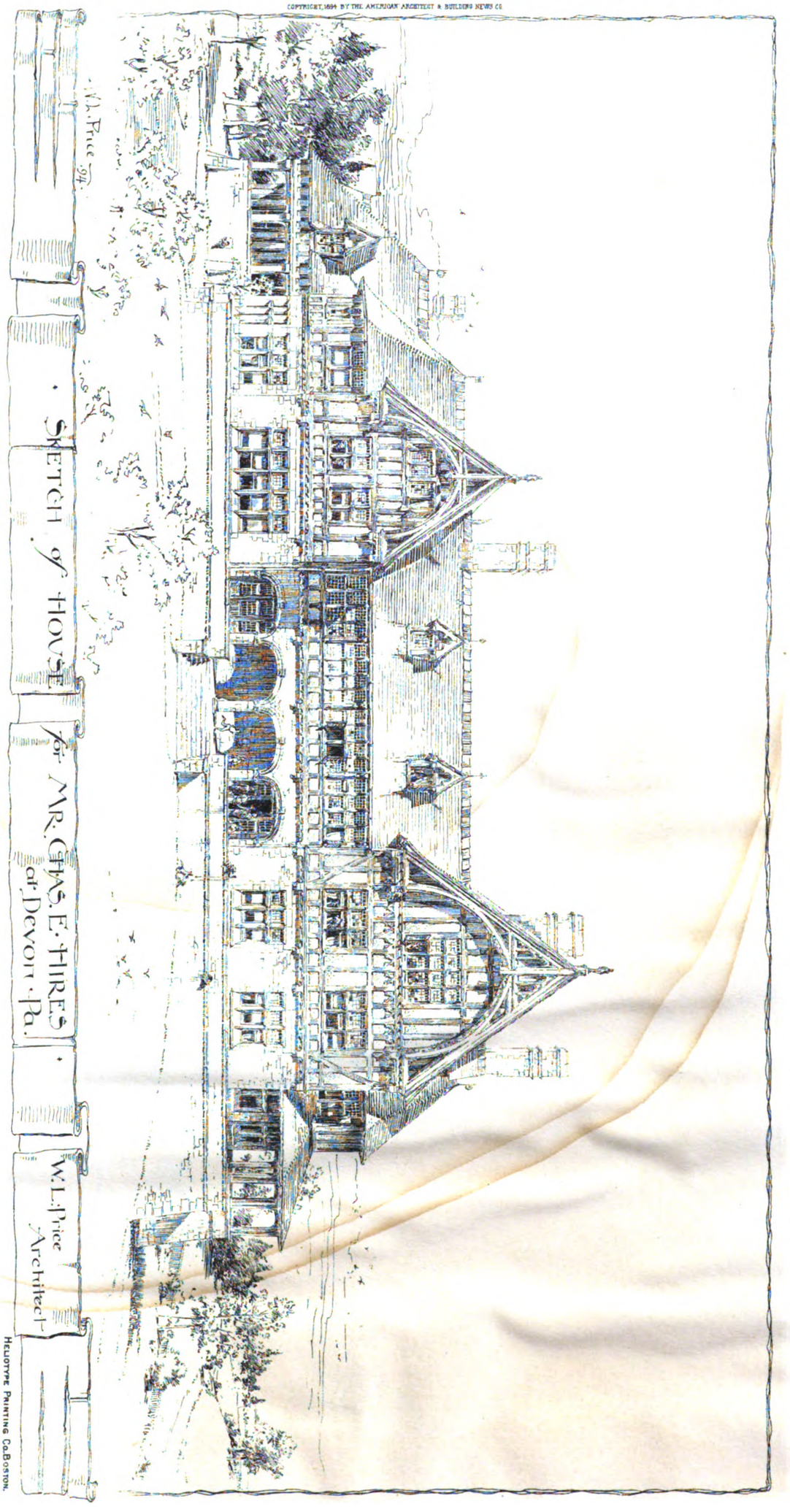
Proposed Midway Plaisance Canal, Chicago. — A petition has been submitted to the South Park Commissioners of Chicago, asking that the famous Midway Plaisance be turned into a canal, drawing its stream from Lake Michigan and supplying the lakes of the park with "live" water. The scheme looks very attractive on paper, for it is proposed that the Plaisance Canal, which would be a mile long and as wide as most tidal rivers, be used for aquatic sports, and for day and night pageants, such as were witnessed at the World's Fair. From bridges picturesquely thrown across the water, as well as from the banks laid out in walks and adorned with shrubs, immense multitudes could view the sights and sports prepared for them on great holidays by the municipality. At present, South Park has meadows, glades, and the lake-front as attractions for the people, but much remains to be done to make it a pleasure resort. In great part the Midway Plaisance Canal would supply the need. The Chicago City Railway stands in the way of the realization of the plan, however, for if the canal were constructed, the company would be compelled to elevate its tracks, an undertaking that would involve a heavy outlay. — *N. Y. Evening Post.*

Long-lived Trees. — The Soma cypress of Lombardy is, I believe, the oldest tree of which there is any authentic record. It is known to have been in existence in 42 B.C. There are, however, many trees for which a vastly greater antiquity is claimed. The Senegal baobabs — some of them — are said to be five thousand years old. The bo tree of Anuradhapura, in Ceylon, is perhaps the oldest specimen of another very long-lived species; it is held sacred upon the ground that it sprang from a branch of the identical tree under which Buddha reclined for seven years while undergoing his apotheosis. The oak is well known to be a long liver, and there are specimens still standing in Palestine of which the tradition goes that they grew out of Cain's staff. The hawthorn, again, sometimes lives to be very old; there is said to be one inside Cawdor Castle of an "immemorial age." The cedars of Lebanon, may also be mentioned, and there are, according to Dean Stanley, still eight of the olives of Gethsemane standing, "whose gnarled trunks and scanty foliage will always be regarded as the most affecting of the sacred memorials in or about Jerusalem." — *Notes and Queries.*

S. J. Parkhill & Co., Printers, Boston, U. S. A.

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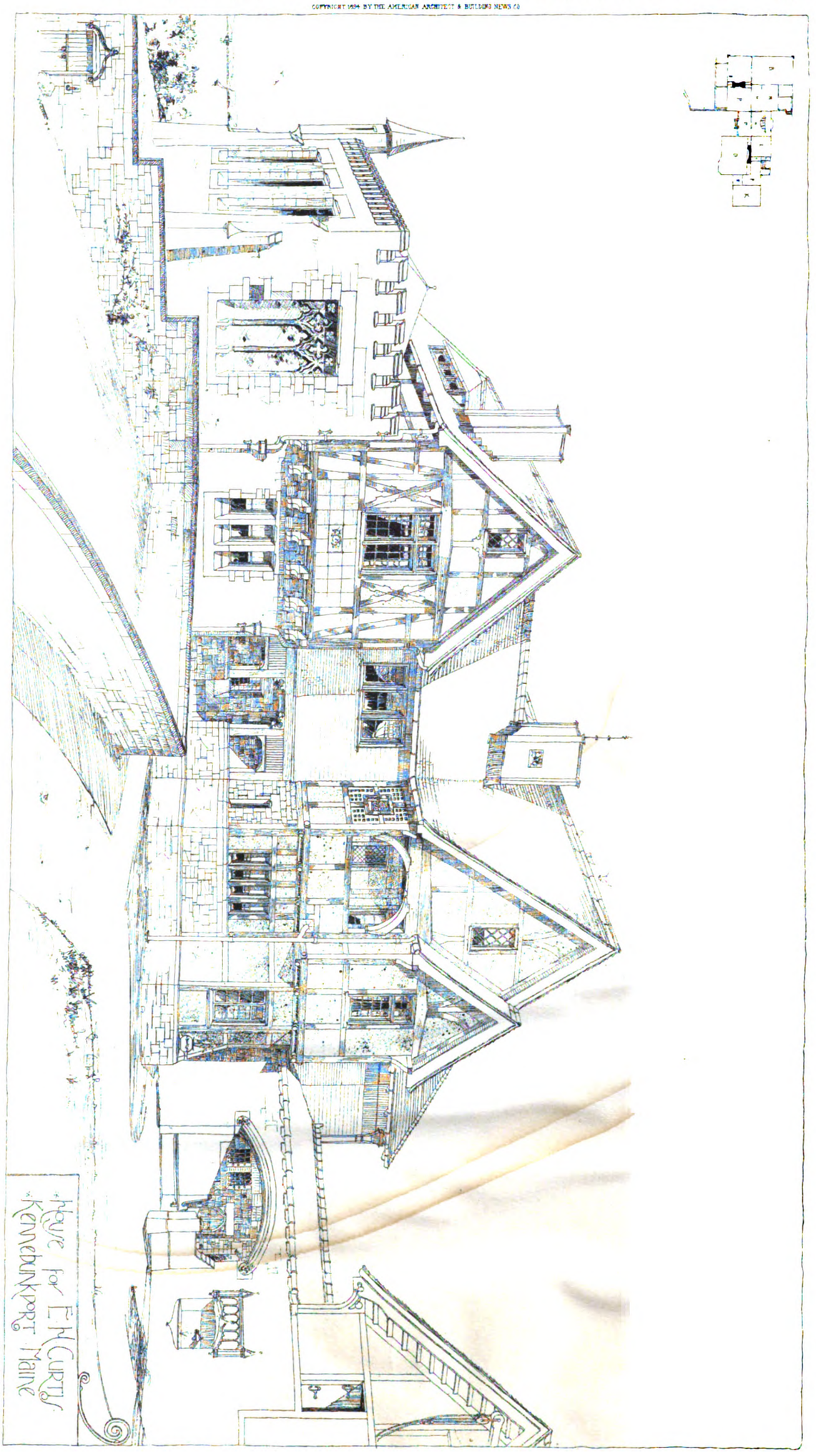
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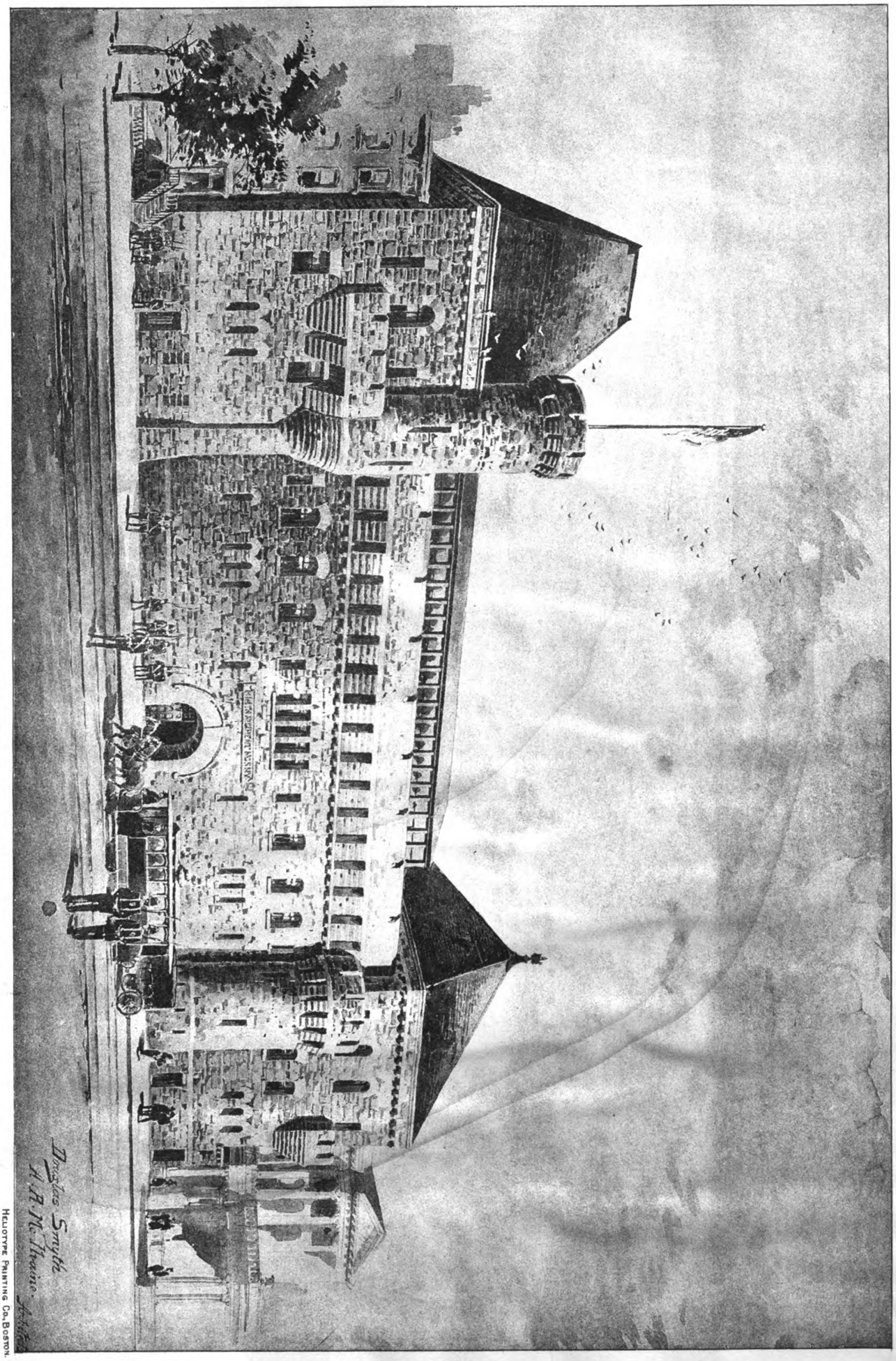
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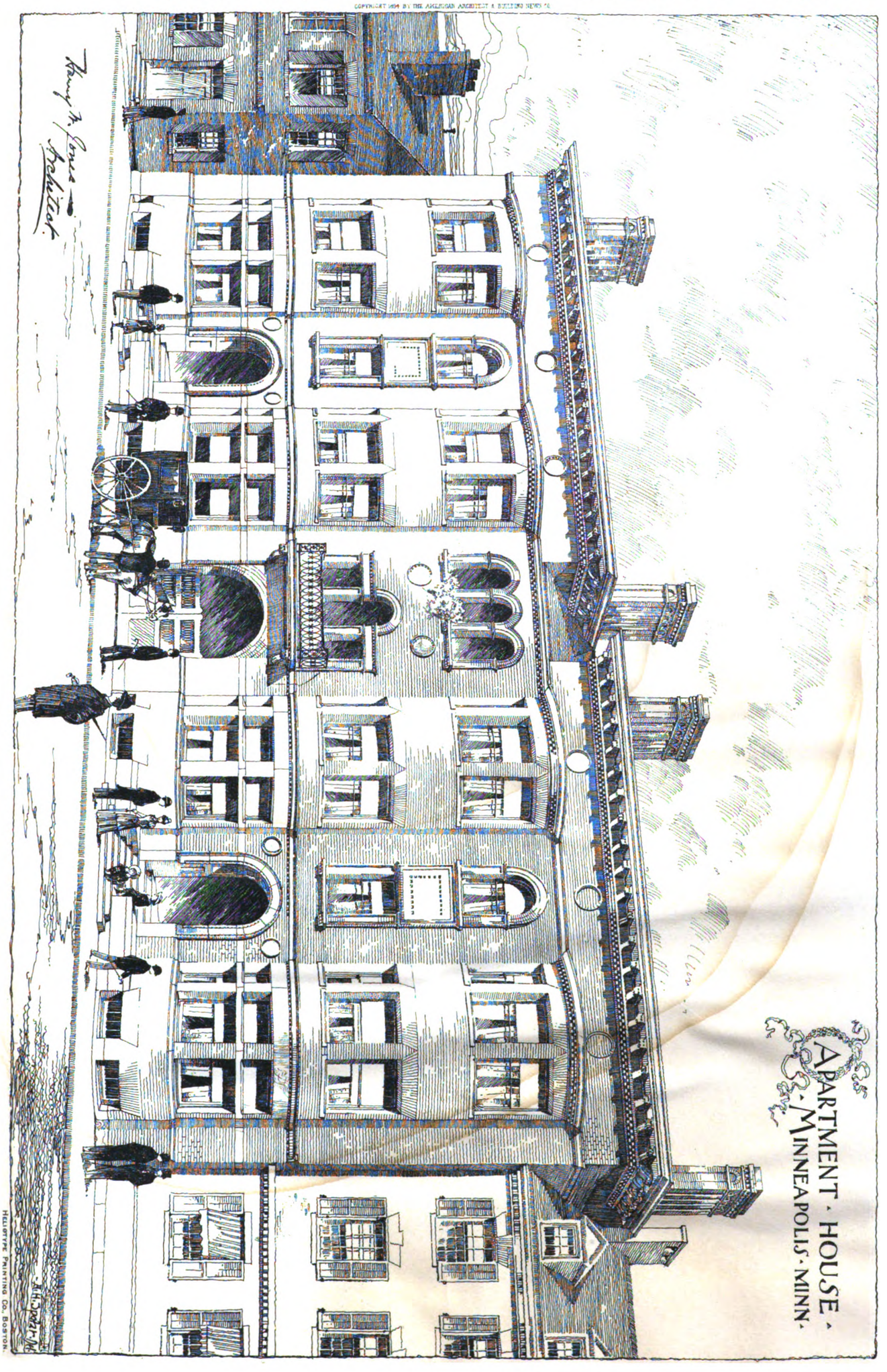
DOUGLAS SMYTH and A. R. McILVAINE, Architects.

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MAY 26, 1894.

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WE have received a good many communications from architects in regard to the New York City-hall competitions, suggesting that we should assist in uniting the sentiment of competing architects in regard to the final settlement of the matter. In most cases, the letters have shown a spirit of honorable desire to promote the common interests of the profession which deserves to be cultivated, and, although we cannot yet quite see what is best to be done to bring the affair to a satisfactory conclusion, we think it is time, as a preliminary step, to invite all persons who submitted competitive designs for the building to send us their names and addresses. There is no longer any probability that any of the designs will be carried out, the Legislature of New York having passed an Act, which has just been signed by the Governor, repealing the statute of 1892, which permitted the erection of the new building on the site of the present City-hall; so that the gentlemen who have, according to current rumors, joined the Tammany Society, or arranged for the distribution of the contracts for the future building, as a stimulus to the appreciation, on the part of the city authorities, of the artistic merits of their designs, will not, apparently, profit much by their enterprise. Meanwhile, however, the task now confronts the competitors of seeing that their rights, as parties to the contract with the City of New York, established by the terms of competition which they accepted, are not infringed, whether unintentionally or not, and for this purpose united action, or, at least, concerted counsel, is likely to be valuable. Of course, the wish of any competitor to have such communications as he may make kept confidential will be respected. What will be the best course to take subsequently will depend on further developments, and, perhaps still more, on the number of competitors who do us the honor of responding to our invitation. Naturally, we could take steps, or make suggestions, as the representative of a large majority of the competitors, which would be out of the question if we enjoyed the confidence only of a select few; and it is for the competitors themselves to say how many of them we shall represent.

THE prospect for the formation of an efficient Municipal Art League in Boston is very bright. At a preliminary meeting, held a few days ago at the Art Club, a large number of the most noted artists, architects and lay connoisseurs were present, and a committee of organization was appointed, including, as representatives of the architects, Messrs. Arthur Rotch, R. D. Andrews and C. Howard Walker; with Messrs. E. C. Tarbell, A. H. Munsell and Frederic P. Vinton, from among the painters; Messrs. C. E. Dallin, H. H. Kitson and William Ordway Partridge, as representatives of the sculptors, and Bishop Lawrence, and Messrs. E. H. Clement, Laurence Minot, Stephen M. Crosby and Edwin D. Mead, and the Rev. F. H. Allen, as non-professional members. As is done in New York, the Society proposes to obtain subscriptions of small sums of money, which will be used to endow the city each year with some worthy work of art. With twelve hundred subscriptions of five dollars each, which ought to be easily obtained, a real treasure of art, although, perhaps a modest one, can be secured every twelve months. Considering the immense sums spent on pictures by rich American amateurs, six thousand dollars a year does not seem much for the endowment of a metropolitan district of nearly a million inhabitants; but the collection will grow, perhaps more rapidly than is now expected; and it will be entirely for the benefit and instruction of the public; while, as it may be well to remember, the manner of selecting the decorations to be ordered, joined with the knowledge and judgment of those who are to make the choice, will secure the acquisition of works whose merit is likely to be increasingly conspicuous, years after some of the hundred-thousand-dollar purchases of millionaire parvenus, abandoned by fashion, have dwindled in value to the cost of the frames.

MAJOR JOHN W. POWELL, director of the United States Geological Survey, and the head of the Bureau of Ethnology which has rendered such signal services to American science, has resigned the first position, on account of the increasing pain which he suffers from old wounds, and is to undergo a long course of treatment at the Johns Hopkins Hospital. His fellow-citizens will join in earnest hope that he may be restored to health, if not to the full exercise of those brilliant qualities which have made him one of the most conspicuous scientific men in the world. Without Major Powell, we should now have known little of the intensely interesting archæology of our Southwestern country, to say nothing of the solid acquisitions in the shape of geological charts of the gold-bearing part of the Pacific slope, the coal and iron deposits, and the phosphate formation, with which the country has been enriched under his direction. His successor as head of the Geological Survey will be Mr. Charles D. Walcott, for many years his chief assistant.

THE good people of Philadelphia have discovered a new kind of pavement. According to the *Press*, the occupants of the offices on the lower part of Chestnut Street, in despair at the clouds of dust which filled the air, and settled on their books and papers, made an investigation the other day to see why the street was not sprinkled, and learned that the company which laid the "asphalt" pavement of the street objected to the application of water to it, and had notified the city authorities that they should refuse to be responsible for the repairs called for in their contract if the "flooding" of the street by the city watering-carts was not immediately stopped. The contract between the city and the paving company is said to require the company to keep the asphalt in repair for five years, and it is certainly a nice question whether this stipulation implies that the city shall not put any water on the pavement. What sort of asphalt pavement it is that will not stand water, those of our readers who know anything of pavements will be curious to know. The streets of Paris run like small rivers every morning, being, not merely sprinkled, but washed, with floods of water, just before the day's traffic begins, and are sprinkled at short intervals subsequently, until late in the evening; yet they suffer no injury whatever. In London, where it rains almost every day, the asphalt pavements are almost constantly wet, independent of the washing, yet they remain quite unchanged. In fact, it is generally considered that, in order to avoid the risk that horses may slip on it, which is, however well founded, the objection most commonly made to asphalt paving, it is necessary to keep it well washed, to remove the thin coating of mud which collects over it, and becomes converted into a greasy slime by rain. If the Philadelphians are bound by their contract to accept a pavement to which the precautions for making such a pavement safe for

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horses, and tolerable for those who pass over it, or occupy offices near it, cannot be applied, we should advise them to invent a new form of contract for the next occasion.

THE great drainage-canal of the City of Mexico, which has been in process of construction for about ten years, is just completed, President Diaz having struck the last blow, with a silver pick, on the first of May. Every one knows that the City of Mexico is situated on a high table-land. The original inhabitants built their town in a depression of this table-land, and the modern city has retained the same site. As there are several lakes in the higher land surrounding the city, which, when overflowed by rains, poured their surplus water into the valley, Mexico has suffered from many inundations. Many years ago, an outlet was provided for flood-waters, by means of a canal, but the flow in the canal is sluggish, and, when sewers began to pour their contents into it, malaria and zymotic diseases took the place of the dangers from inundation. It has long been certain that the valley could only be effectually drained by means of a tunnel, to allow the water to escape through the encircling barrier of hills, but the estimated cost seemed to put the undertaking beyond the reach of a comparatively poor community. In 1883, however, the Government resolved to begin the work, whatever the cost, and its completion, at an expense of about ten million dollars, is a striking testimony to the energy and perseverance of the Mexican people. The drainage-canal itself is about thirty miles long, but the greater part of the expense was confined to the outfall end, which penetrates the hills by a tunnel seven miles long.

A SMALL law-suit was decided in England the other day, which affords a certain amount of instruction and warning, to architects as well as owners. An architect sued the vicar of a certain church for compensation for professional services in connection with a proposed restoration of the latter's church. It appeared that the architect was engaged on the restoration of another church, when the vicar happened by, and, finding the architect there, mentioned that he was thinking of making some improvements in his own church. Soon after, he wrote the architect, asking him to come and see him about the matter. The architect complied with the request, and the two went to see the building, and talked over the proposed improvements, as well as the methods of raising money to pay for them. The vicar said that he hoped to get some of it by subscription among the neighbors, and intended also to apply for grants from the Church Building Society, and the Diocesan Church Building Society. The architect said that, to obtain these grants, plans must be submitted to the societies, to which the vicar made no objection. Soon afterwards the architect went to the church again, to take measurements, and made sketch-drawings, which he showed to the vicar, and the latter asked him to make definite plans. This he did, showing work which he estimated would cost £350. When the plans were done, he wrote to the vicar, asking when the work would be begun, but could get no definite answer, although he wrote several times afterwards. His next step was to send a bill for £10 on account for services. No answer was made to this, and he finally sued for his full bill to the time of the suit, consisting of several items. The first item was one of one guinea for the preliminary interview; the next was for nine guineas for measuring, at the rate of two guineas a day. For his further trouble and skill in making the detailed plans, he charged three per cent on £350, his estimate of the probable cost, making ten guineas. He also charged five guineas for making the special sets of plans to be submitted to the societies; and one guinea for "incidental expenses."

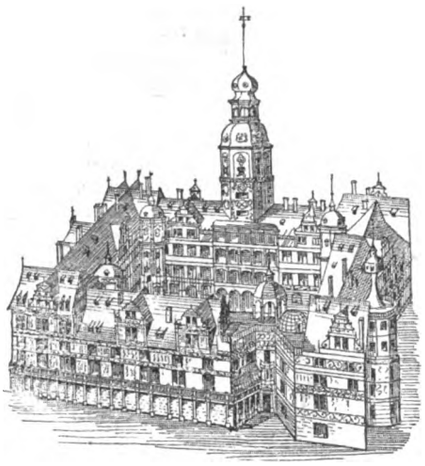
THE defence claimed that the whole affair was a very trifling one; that nothing was intended but to remove some old pews, and replace by slips, and lay some new flooring. Some other matters were mentioned, but only by way of conversation, and the whole cost of the work for which plans had been prepared would not exceed £150. Moreover, as the defence alleged, the architect had only been instructed to prepare a plan for the vicar's approval, and the latter had never approved of the plan. This last somewhat threadbare defence does not seem to have availed the vicar much. The judge took no notice of it, apparently, but occupied himself with examining the items in the architect's bill. The first, of a guinea for the preliminary visit, he struck out; the second, of nine guineas for measuring, he said seemed to him reasonable and proper. As to the charge of three per cent on the estimated cost, for making plans, he said it would have been far better to have reckoned the amount in accordance with the time employed in making them, rather than by percentage. He thought that something was due, but considered that six guineas would be enough for this item. The charge for making plans for submission to the societies he declined to allow, saying that the plaintiff ought to have waited for instructions before preparing them; and he did not think that the charge for incidental expenses ought to be allowed. The architect's claim was therefore reduced to fifteen guineas, and judgment was given for this amount, with costs.

A QUEER piece of anarchy, or socialism, or collectivism, or Fabianism, or whatever else may be the newest name for the old trick of hoisting the members of a favored organization upon the shoulders of the unfortunate people who do not happen to be the pets of demagogues, has, apparently, been perpetrated by the London School Board. At a recent meeting of this eccentric body, as we are told, "the question of wages was discussed"; and, ultimately, it was resolved that all future contracts entered into by the Board for building work should contain a clause, compelling contractors "to pay the rates of wages mutually agreed upon by the London Building Association and the London Building Trades Federation." As the School Board for London does a great deal of building, it may be presumed that the Federation has lost no time in advancing the rates which are to be crammed down contractors' throats in this way; and, as usual, the people who pay small rents, and buy at retail, upon whom, in the end, the burden of public extravagance always falls, will have to foot the bills. There is a certain novelty, and not a pleasant one, in seeing the London authorities follow the lead of the Municipal Council of Paris. The Conseil Municipal has begun to appreciate the Anarchist logic which argued that if the "bourgeois" could be terrified by oratory into paying more for work than it was worth, they could be scared by dynamite into paying people to do nothing; and has somewhat relaxed its efforts to elevate the working classes by enabling them to stay drunk three days in the week instead of two. Whether the development of practical Fabianism in London will have a similar course remains to be seen.

A VERY novel method of making sugar has been patented in France by M. Pellegrini. Sugar is, chemically, a compound of carbon, oxygen and hydrogen, in such proportions that, if carbonic acid, water and certain kinds of illuminating gas could be persuaded to unite, in the proper quantities, the composition of sugar would be exactly imitated. Hitherto, no one has been able to make sugar by mixing water with two kinds of gas, but M. Pellegrini claims to have succeeded. The apparatus he uses consists of a large block of pumice-stone, cleaned by soaking, first in sulphuric acid, and then in water, which is set in an iron box, plated with nickel inside. The length of the box is three times that of the pumice-stone block, which is tightly fitted into the middle, and pipes are arranged to convey the ingredients to the empty ends of the box as required. Two of them enter from the sides, and serve to bring carbonic acid and hydro-carbon gas, while another pipe from above, branched so as to reach both empty portions of the box, conveys steam. All the pipes are fitted with valves and pressure-gauges. Another pipe, at the bottom of the box, serves as an outlet. At first this pipe is closed, as is also the steam-pipe from above, and carbonic acid is forced into one end of the box, while ethylene gas is forced into the other, under equal pressure, and in equal volumes. A few minutes later, the steam-valve above is opened, and steam forced in, under the same pressure. As the gases unite, the pressure falls, so that the supply of each must be kept constant. At the end of half an hour, the supply of gas is shut off, the outlet pipe is opened, and one of the chambers is found to be filled with syrup, containing twenty-five per cent of sugar. The syrup is drawn off for refining, and as soon as the apparatus is cool, it is ready for a fresh charge. The ethylene gas can be obtained by roasting rosin or grease, but M. Pellegrini's patent covers other hydrocarbons, such as petroleum products. The explanation is that the three gases are condensed in the pores of the pumice-stone, and there unite; but M. Maumené, who has made some experiments declares this to be doubtful, and, in *Cosmos*, expresses doubt as to the success of the process.

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STYLE.[1]—IV.



The Royal Palace, Dresden.

LET us make some investigations of our subject, with the aid of examples, either by *analysis*, in the order designated: study of general qualities, study of the laws of construction, examination of the laws of æsthetics, showing the dominant sentiment which must harmonize with the first two studies in order to draw therefrom the characteristic principle, the objective point of all researches in style; or by *synthesis*, in the reverse order: a monument having been examined and the characteristics having been obtained from the dominant sentiment experienced in the presence of the structure, we will endeavor to determine by an examination of the laws of æsthetics whether the monument embraces concurrently the laws of construction and the general qualities in order to be sure of the presence of a style. This investigation, which comes within the realm of archæology, receives its confirmation from history and serves to verify it.

In citing examples, we shall select those monuments whose constructive elements are the most typical, so as to take up architecture with the lintel, architecture with the arch, structures in stone and structures in brick. We will glance at the monuments of Egypt, Assyria, Greece and Italy, closing with those of France.

For the first example, let the synthetic method be adopted.

Without pausing at the Memphite civilization or the Ancient Theban Empire, we will come at once to the New Empire, the monuments of which present, like those which preceded them, all the resources of a complete art. We will pass by the tombs of Thebes, on the left bank of the Nile, and turn to the temple of the god Khonsu, on the right bank south of Karnak. Although of moderate size, especially in comparison with the neighboring temple to Ammon Ra, a gigantic edifice the largest of the kind in Egypt, the temple of Khonsu may be taken, on account of the unity of its plan, as a representative example of Egyptian temples. In front, towers the massive entrance pylon, formerly approached by an avenue bordered by sphinxes; it stands out in an imposing manner in the glowing sunlight against the blue sky. It measures 32 metres in length, 10 metres in thickness and 18 metres in height; within is a staircase leading to the terraces. It is of similar aspect to all pylons and comprises two truncated pyramids, connected by a lower section in which the entrance is pierced; the sides are adorned with hieroglyphics and figures. The walls slant and on the outer face, extending one-third of the way up, are four recesses designed for seated statues and flagstaffs, to which streamers were attached on festive occasions. The angles are adorned with a torus which completely frames the mass, and the three distinct parts are each crowned by a widely-projecting cavetto. On that above the doorway is sculptured an egg, or globe, with a wing at each side. We enter the first court advancing from south to north, the direction in which the temple is set. On the north, east and west, this court is surrounded by porticos formed by two rows of columns, the shadows of which prepare one for the continually-deepening gloom of the series of halls. The floor of the temple slopes gently upward from the court toward the sanctuary, while the ceilings of the apartments are lower in proportion as they recede from the entrance; in this way the perspective is exaggerated and an effect of distance much exceeding the real distance is obtained; this impression is generally augmented also by the restricted dimensions of the rooms leading to the sanctuary.

We enter a hypostyle hall with eight columns, of which the four at the centre are taller than the others and divide the hall into three naves. The loftier central part admits the discreet light of day at the sides through stone clerestories, and the three naves, like all the covered portions of the temple, once had stone roofs forming terraces. A sober twilight therefore pervades this hall; the middle columns are 7 metres high and are capped with campaniform capitals, while the others are but 5.50 metres in height with lotiform capitals. The bases of the columns are circular; the capital and the bottom of the shaft are embellished with leaves; heavy stone architraves, connecting the columns, once bore the ceilings. Beyond the hypostyle hall is the sanctuary, or *secos;* it is dark, and around it runs an isolating passage 3 metres in width; at the right and left, opening on the passage, are four rooms, which were used for storage, and a stairway. Behind the *secos* is another hypostyle hall, with four columns only and giving access to seven rooms devoted to the purposes of worship. The bas-reliefs are sculptured in the mass of the stone and have the effect of a very smooth modelling; the inscriptions are sunken and the proper names in them are surrounded by a closed line forming a cartouch; the whole possesses the characteristics of the majority of Egyptian monuments.

The *sentiment* which a visit to the temple of the god Khonsu discloses is a majestic simplicity, an imposing grandeur, a profound stillness and a stability as everlasting as was the idea that the Egyptians entertained of the divinity. As, according to the beliefs of the inhabitants of the Nile valley, the period during which the immortal soul was separated from the body was far longer than that of life, they built their dwellings of brick and clay, while their tombs were constructed of durable material; but with greater reason still, eternity, with its mysterious symbol, the struggle of day and night, of life and death, was the characteristic of the temple, the abode of the gods. This was manifest in the very aspect of the edifice, whose stability defied the revolutions of nature; man alone, after repeated devastations, has succeeded in wresting a little from it.

This *characteristic, eternity*, was indeed the dominant need, the chief solicitude of the Egyptians; traces of it are discovered everywhere in their architecture, their sculptures and their paintings. It is the sentiment of immortality that strikes us, and, the characteristic responding to it is a material eternity, the *æsthetic conditions* of which furnish the conception of a robust beauty. The Egyptian temples were reared with materials of great size, and frequently precious. These were utilizable for spanning broad spaces and the architects of the period were therefore led to adopt the lintel and the column as a point of support; the object of terraced roofs in a country where rain never falls is evident, as is also the cause of the comparative darkness of the dwellings, under a blazing sun and with the excessive heat of the climate; therefore, the laws of stability, as the edifices have proved, satisfied the very rational laws of construction that prevailed in Egypt. In the arts, the Egyptians, whose civilization had far outstripped that of other peoples, cannot have borrowed the expressions; hence, their great *purity*. The influence that presided at the origin of this temple architecture was the idea of profound gratitude to Nature and of the absolute immortality of the gods; this idea was never modified, even by contact with neighboring peoples, so that the same influence appears in all ages, and constitutes the peculiar property, or *propriety*, of Egyptian religious architecture. As has been said, the choice of construction with lintels and columns was imposed upon architects by the very nature of the materials furnished by the soil; and their use answered in a *clear* manner the well-defined demands of worship, in *ensemble* and details alike. The moral and material needs were both deeply rooted in the heart of these dwellers in the valley of the Nile; they had grown out of their observations of Nature and their spiritual aspirations toward another existence; under their action industry had risen to the level of an art, but an art that always derived its principles from the *natural* order of facts, after a careful survey of the end and the means. The Egyptians were by nature too reflective not to insist upon, in the general disposition and in the coördination of details, that *appropriateness* which is indispensable in a work like a temple; in fact, in examining the structure reared in honor of the god Khonsu, whether it be the plan, the elevations or the construction and ornamentation, we are impressed with the complete harmony of all the parts. This temple possesses all the requisite *principal qualities*, and we may conclude that it is a monument of STYLE.

Archæology, by classing the general indications noted above, confirms the known facts of history. It teaches us that in

[1] From the French of Léon Labrouste, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 960, page 72.

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sculpture and painting symbolical decoration, depicting the sources of terrestrial life and celestial power, was summed up in Ammon Ra Karmakhis, the omnipotent sun, the victorious day of Apap, the night, and in his wife Isis, the beneficent earth, foster mother of the human race; the immortality of the soul was figured by a hawk-winged genius; the death of the body was typified in Anubis, a man with the head of a jackal; lastly, the emblem of physical rebirth was the scarabee. These symbols, accompanied by scenes from private life, occur with legends in the tombs, while, in the temples, the decorations represent the kings sacrificing to the god and acting as mediators between the divinity and mankind. The decorations are expressed everywhere, though with varying degrees of skill. Bodily strength, rendered with simplicity and joined with a certain delicacy, is one of the characteristic features of Egyptian sculpture; at Memphis there is an admirable accent of truth about it, while at Thebes, down to the fifteenth century, B. C., when it is full of beauty and dignity — there is a departure from Nature on certain points. The horse is not pictured until the time of the wars against Assyria, under the eighteenth dynasty; lastly, the works following the twentieth dynasty are purely conventional. At Memphis, the zenith of art was reached under the fifth dynasty; at Thebes, during the First Empire, under the twelfth dynasty, and during the Second Empire under the eighteenth; then came a sort of Renaissance at Saïs, under the twenty-sixth dynasty. The Egyptian style slowly degenerated during the space of nearly a thousand years, though foreign invasions wrought no perceptible change in artistic notions. Figure painting was, in general, conventional while decorative painting attained remarkable excellence. The wonder of travellers in the presence of monuments of such high antiquity is not to be marvelled at, when we consider edifices like the Temple of Ammon at Karnak — on which the Pharaohs worked for nearly three thousand years — with seven successive pylons preceded by an avenue 2,000 metres in length, bordered by sphinxes and terminated by obelisks, or the Temple of Luxor, containing a hypostyle hall with one hundred thirty-four columns bearing a roof at the height of the Vendôme Column, on capitals the abaci of which have each an area of 80 square metres — a hall entirely covered with sculptures and paintings, and on the floor of which would be placed four cathedrals like that of Paris.

Archæology and history accord in fixing the date of the construction of the temple, of which a synthetical study has been made above, in the fifteenth century, B. C., under the twentieth dynasty, the builder as King Rameses III, and the dedication of it to the god Khonsu.

For our second example we will employ the analytical method.

Let us look at what remains of the Assyrian palace constructed at Khorsabad, near Mossul.

Since architecture, in the golden age of a style, presents a complete harmony between all its elements, supplied by the national character and subject to climatic laws and the means of execution, we will endeavor to determine whether the *general qualities* constituting this harmony exist in the palace of Sargon.

Above an immense plain may be seen a course in unbaked brick, surmounted by a battlemented rampart in enamelled brick; these are the remains of an Assyrian palace. In general form the plan is a vast parallelogram, the interior of which is divided into three principal parts for habitation. Each of these divisions has its private court and a single door gives access from one to the other. The total surface embraces an area of 100,000 square metres. Bestriding the city ramparts, the palace is half in the town and half in the country, and is apparently the fortress of the city. The entrance is on the side toward the town, at the extremity of the steps leading to the level of the course on which it is built. The structure contains two hundred and nine rooms, and on the same course as itself is a tower, or sort of observatory, rising in seven retreating stories, constructed of gayly-colored bricks: white, black, purple, blue, vermillion, silver and gold. The outer walls were furnished with buttresses.

Brick is the important constructional element employed by the Assyrians. It stamped upon architecture, in details as in *ensemble*, an absolute purity of origin, which was due to the material employed by a military nation, whom the very *propriety* or *property* of its conquering character forced to build citadels that could be conveniently constructed by soldiers and prisoners in conquered countries. When the general plan was once adopted, nothing was of greater importance than to endeavor to obtain the forms best adapted to the size of the materials selected, and it was with perfect *precision* that the constructors succeeded in assigning a special function to each particular organ, whether to support, to span, or to protect. Material needs and moral aspirations called for programmes which corresponded with *clearness* to the necessities of the moment. These necessities, always imperious and which must be satisfied, demanded solutions that were simple and, consequently, approached the *natural* order. The Assyrians suited their dwellings perfectly to their needs and to the means at their disposal; the decoration of their architecture was very rational and the *appropriateness* which they were able to put into the combination of all their constructive elements made their monuments works of STYLE.

The peoples of the north of Mesopotamia were warlike; their palaces resembled fortresses where the monarch, hidden from the eyes of his people, hardly experienced other sentiment than that of pride, other need than that of conquest, other pleasures than that of sanguinary orgies. Its gods were terrible, its literature crude; its king thus extolled his victories: "The trappings and arms, the trophies of my conquest, swam in the blood of my enemies as in a river; my war chariots, which crush men and animals, had ground their bodies in their course. I have reared as a trophy heaps of dead bodies, the extremities of whose limbs I have lopped off; I have mutilated all those who have fallen into my power alive. I have cut off their hands." . . . "The wrath of the great gods, my lords, weighed heavily upon them; not one escaped, not one was spared; they all fell into my grasp; their chariots of war, their trappings, their wives, the treasures of their palaces were brought before me. I have pulled out the tongues of the men, whose lips had formed terrible plots against me and against Assur, my lord, and I have worked their destruction. The remnant of the people were exposed alive before the great stone bulls that the father of my father had set up, and I, I have thrown them into the ditch; I have cut off their limbs, I have caused them to be eaten by dogs, wild beasts, birds of prey, denizens of the air and the water. In accomplishing these things, I have rejoiced the heart of the great gods, my lords." Architecture was the living expression of the sentiments that we find traced in cuneiform characters on clay and stone.

The *principal need* of Assyrian monarchs was to impose forcibly their rule upon all surrounding lands; hence the use of an architecture in which the processes of construction lie in the mass of materials easily utilizable by unskilled hands and brought together in colossal profusion. The walls built of these unbaked and baked bricks, are not less than 3, 8 and even 25 metres in thickness, and receive vaults and cupolas, also of brick, surmounted for the most part by terraces with rounds and with towers for observation and defence, the whole furnished with battlements. The bricks were cemented together with bitumen, the wall-facings were adorned with a very remarkable decoration of enamelled bricks, which Herodotus speaks of in terms of admiration; the doorways were semicircular, with archivolts. The Assyrians derived their earliest constructional principles from the Chaldeans; however, they introduced stone in certain parts designed for carvings. These sculptures, but slightly varied in expression when representing the human form, which remains pompously cold, squat and exaggerated, are exceedingly beautiful in reproductions of the attitudes of animals; but what to us is especially curious and peculiar in Assyrian architecture, aside from the enamelled decoration and the sculptures depicting hunting-scenes, is certainly, the variety of vaults of all forms, employed in accordance with needs and revealing an astonishing knowledge of the laws of construction.

The palace of Sargon, at Khorsabad, is imposing in size and rich in decoration; yet, in viewing it, we experience, from an *æsthetic standpoint*, a painful impression. It is not a palace that we have before us, notwithstanding its wonderful magnificence, but a fortress where everything betokens a work of defence; the lofty ramparts, the towers, the lack of communication between the exterior and the interior. It is terrible in appearance, nothing invites one to enter, and *fear* is the *characteristic* sentiment that it induces.

If we compare what *archæology* has unearthed concerning the Assyrian civilization with the *historic facts* that have come down to us, we discover their complete accord, the natural confirmation of the results arrived at. They show us proud, cruel

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warlike kings interrupting their wars and their hunts only for nameless orgies, in which the conquerors dishonored themselves in the punishment of the vanquished.

The results also show that the palace which we have just analyzed was constructed in the eighth century B. C., by Sargon, King of Assyria.

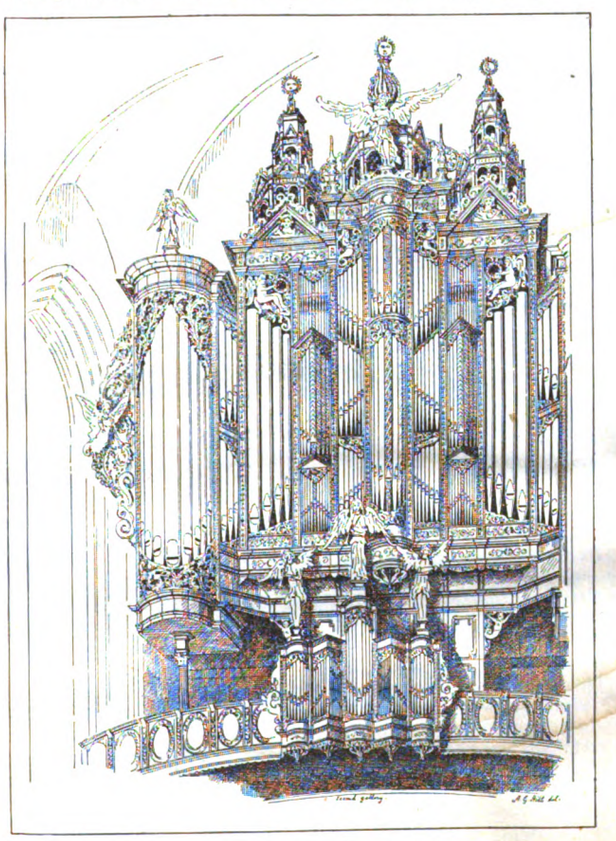
[To be continued.]

THE CHURCH ORGAN, ARCHITECTURALLY AND ARCHÆOLOGICALLY CONSIDERED.[1] — II.



An early Organ shown by a Bas-relief on the base of the Obelisk of Theodosius, at Constantinople.

WE must now call attention to the type of old organ provided with wings or shutters turning upon hinges. These appendages, the prototype of the modern pianoforte lid, were used to fold over the pipes to protect them when the instrument was not being used, and also to hide the organ during penitential seasons, as Lent, when it is also customary to veil pictures and images. These doors are always painted and decorated, and have a splendid effect when opened, thus reversing the outline of the case in similar manner to the wings of a triptych. At Sion the subjects are the mystic marriage of St. Catherine, and our Saviour and St. Mary Magdalene in the garden. Shuttered organs are rare in Northern Europe, though of more frequent occurrence in the South, in Italy and Spain. There are fine examples at Salamanca, Barcelona, the New Church at Amsterdam, Dol in Brittany, Milan Cathedral, the Carignano Church in Genoa, San Sebastiano at Venice and in the cathedral at Perpignan in the French Pyrenees. This last is a magnificent example of a Mediæval organ of great size, and is of Spanish workmanship. The doors are wooden frames with canvas paintings, some thirty feet high, producing an effect of great dignity. Unfortunately the doors have recently been removed from the organ and placed against the wall of one of the side chapels as pictures.

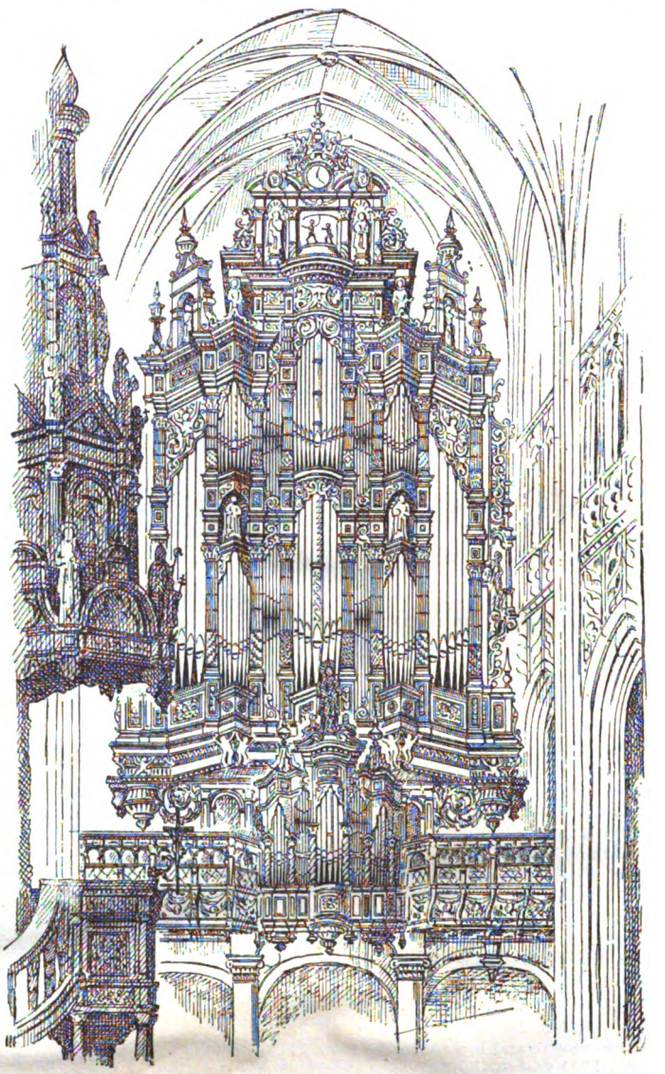


Organ in the Johannis Kirche, Luneburg, Germany.

There is no doubt that many old organs of which I have made drawings originally possessed doors, but have now lost these adjuncts.

The organ in the church of St. George at Nordlingen, in Bavaria, is in many ways highly interesting. It was built in the year 1466, by the celebrated Stephen Castendorfer, of Breslau, who was also a noted organist. The records of the town show that there were two paid organists at Nordlingen as far back as 1412, at which time an instrument was built for the church of the Barefooted Friars. The organ still stands in a beautiful Gothic gallery erected in 1450. It is adorned with paintings representing our Saviour and certain saints. The doors are decorated with subjects illustrating the Nativity and Resurrection, executed in 1605 by Simon Metzler. The whole case is painted and gilt by an artist named Jesse Herlen. Very little of Castendorfer's original organ remains, and the case as we now see it was remodelled about the middle of the sixteenth century, to which date much of its fine detail belongs.

The very remarkable example from the church at Jutfaas, near Utrecht, next claims attention. This is wholly unlike any other old organ I have yet come across. It consists of an extremely beautiful spire-like composition of tabernacle-work, and the design is obviously borrowed from contemporary work seen in altar-pieces, font-covers and such like, and is, perhaps, of a form not much suited for adoption as an organ-case. The whole dates from about the year 1500, and is attached to a beautiful gallery with iron grilles and candle prickets.



Organ in Church of St. John, Bois-le-Duc, Holland.

There are two imposing Mediæval organs at Saragossa, in Spain; one in the cathedral, and the other in the church of San Pablo. The former stands above the stalls on the south side of the *coro*. It was built as early as the year 1413, and has curious pyramidal crowns to its three towers and fine traceried shades above the pipes. There is also much costly tracery throughout the design. You will notice that the trumpets project horizontally from the front of the case, a treatment seen in almost every organ in the Peninsula, and which produces a very majestic effect. Some of the later instruments perfectly bristle with rows of trumpets, placed in several tiers, one above the other. This arrangement, also, is acoustically good, and protects the reed stops from dust.

The organ in the church of San Pablo is somewhat similar to that in the cathedral, and dates from about 1420. I may mention that the horizontal trumpets are later insertions, reed stops being unknown in the earlier organs.

The organ in the great cathedral at Barcelona is a Renaissance work of 1546, and is an imposing structure with large painted doors.

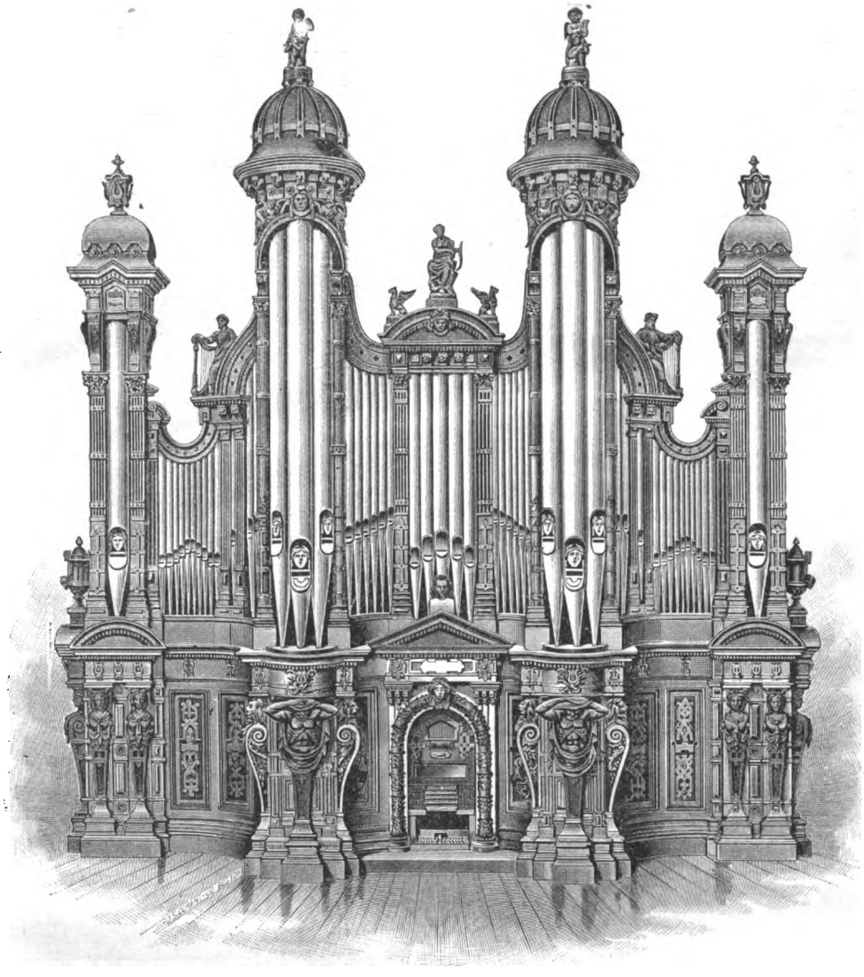
[1] A paper read by Arthur G. Hill, M. A., F. S. A., at the meeting of the Society of Architects, on December 11, 1893. Continued from No. 959, page 64.

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I think, however, that the organ in the cathedral of Tarragona, though late in architectural style, is, without doubt, the grandest piece of design in the matter of organ-cases to be found in Spain. It was built in 1563 by Canon Amigò of Tutosa, and stands above the stalls on the north side of the *coro*. The design is very classical and somewhat square, but the magnificence of its detail and the richness of its parts, coupled with its great size, constitute an architectural production of the noblest kind. Here the dignity afforded by its outspread doors is strikingly manifest. This case, as is usual in later examples, is of unpainted oak, and is now very dark with age.

Another very pretty shuttered organ stands in the ancient church of San Filiu, at Gerona, in Catalonia, and which is a good type of Spanish of the sixteenth century, and worthy of adoption for modern purposes.

In the Marienkirche at Dortmund, on the Rhine, is a fine Gothic organ of the fifteenth century, standing in a beautiful wooden gallery, with a tribune and *cul-de-lampe*. The cresting is similar in design to that seen in the grand organ at Strasburg Cathedral, and is characteristically German. The case has three semicircular towers of pipes — the only Gothic example of this treatment that I know of.



Organ formerly in Music-hall, Boston, Mass. (Published by permission of *The Organ*.)

We have here a drawing of the Strasburg organ, which is a remarkable work of the year 1497, and illustrates in a powerful manner the true principles which guided the design of such objects in the Middle Ages. The gallery is a beautiful feature, and the whole composition was well utilized by Sir Gilbert Scott in the Ely Cathedral organ. The doors which formerly belonged to the Strasburg organ have long since disappeared, and the tradition of such lateral expansion is maintained by the projecting pieces of carving at the sides, with excellent result.

In Amiens Cathedral still stands an organ, the case of which is, apparently, the oldest in France. It was erected in 1429, and remodelled, as it now appears, in 1550. The flat front attests its early date.

There are also fine Gothic organs at Hombleux, near Amiens, and at La Forté Bernard, in the Sarthe. The latter instrument is a transition from the Gothic to the Renaissance, and is a charming work of that period, the gallery dating from 1501 and the *buffet* from 1536, the latter the work of Pierre Bert, organ-builder of Le Mans.

There is a remarkable work of the time of François I at a village near Paris. It was originally painted and gilded all over, in a very beautiful manner, and has embossed and gilded pipes. It is one of the earliest examples of Renaissance woodwork in France, and dates from 1508.

The chasing or embossing of the front pipes is a fine feature not commonly seen, but it was not unusual with the English builders of the Restoration, and examples still remain at Tewkesbury Abbey and Stanford Church, Northants, of which there are here drawings.

In this somewhat discursive paper I have as yet omitted to mention the fine organ in the Church of St. Anne at Augsburg, built in 1502, the doors of which were painted by Holbein and Hans Burgmair, at the expense of the great merchant family of Fugger.

It should be bourne in mind by modern architects that it was the almost invariable rule among Mediæval architects and artists to paint and decorate in gold and color the entire surface of such objects as organ-cases, screens, rood-lofts, altar-pipes, etc., whether made of common or costly wood, or even of stone. For this reason a well-designed organ-case of deal, painted and gilt, is as fine a thing as any church need possess, though, unfortunately, but very few modern architects are competent to carry out work of this kind.

Conspicuous among the drawings here to-night is that of the organ at Bois-le-Duc, in Holland. This glorious piece of work is certainly the finest in Europe of its style, and you may judge of its great size and magnificence when you are told that this instrument, with its gallery, would barely find height enough if erected at the west end of Westminster Abbey, our loftiest English church. The case is about 100 feet high, and was erected in 1602, and our largest church organ is, in appearance at any rate, a pigmy beside this continental giant.

The main outlines are quite Gothic, while the detail is Classic, very freely and sumptuously treated. Both the main organ and the choir organ possess embossed pipes.

The modern craze for so-called "restoration" nearly caused the demolition of this noble organ, because it was not "Gothic," and so did not agree with the ridiculous notions regarding uniformity of style; but the townspeople rose in arms against such vandalism, though they were too late to save the magnificent marble rood-loft, which has now found its way into South Kensington Museum.

Through the kindness of Herr Hezeumanns, the architect, I have had tracings given me of the original drawings of this case now preserved in the Cathedral library.

Flemish and North German Renaissance is usually very fine in the matter of woodwork, and we are able to put on the screen a representation of the organ in the great Church of St. John at Lüneburg, near Bremen. This is a chaste and dignified specimen of sixteenth-century work, very Gothic in feeling and delicate in detail. It is in many ways a fine composition. The large side towers are, of course, later additions, necessitated by the extension of the pedal organ. There is no doubt that the great Sebastian Bach has many times played upon this organ when he was attached, as a youth, to the St. Michael's School in this town, and became known to Böhm, the organist of St. John's.

Even much later examples of organ-cases than these selected specimens which you have seen are often grand and most imposing works, as, for instance, that in the so-called New Church at Amsterdam, built in 1673, and of which we here have a drawing. Though so far on from Gothic times, yet the outlines remain excellent in every way.

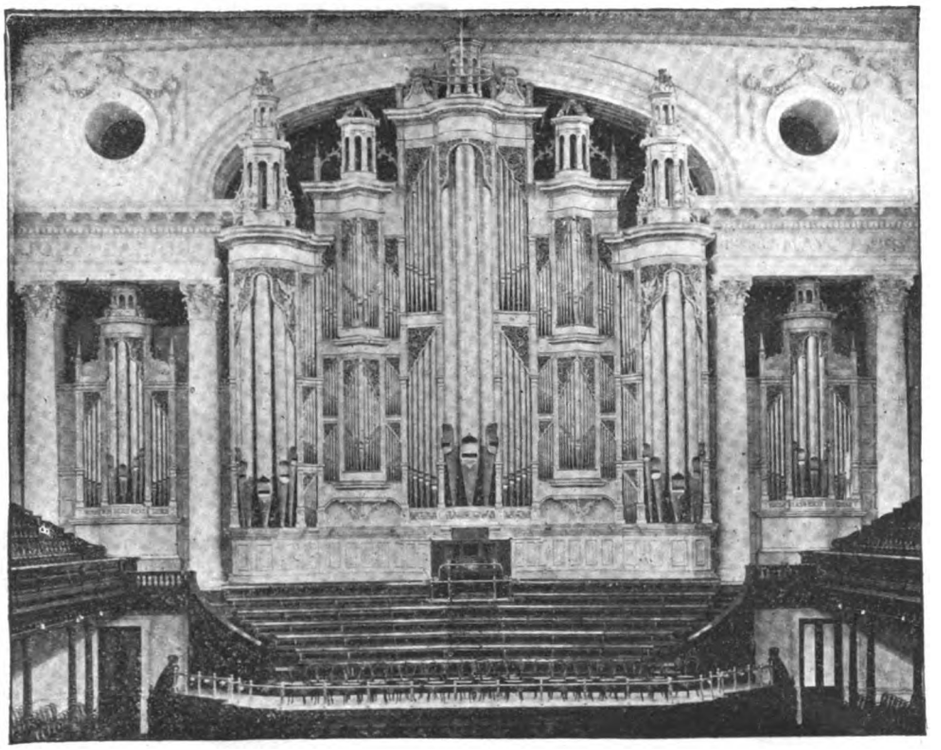
There is a splendid organ of about the same date in the Jacobikirche at Stralsund, in Pomerania, which is an altogether exceptional production, and which fills the entire west end of this vast brick church.

Before turning to English organs, we will call attention to three Italian specimens of high interest. The first is that in the church of San Petronio at Bologna, and is, I believe, the finest, if not the only, remaining Gothic organ-case in Italy. It was built in 1470 by Maestro Lorenzo di Giacomo da Prato, and I am inclined to think that Flemish workmen must have been responsible for the lovely traceries of the pipe shades, which have a character that is but slightly Italian, though the general arrangement of the pipes is so, and the shields of arms are of Italian shape. This organ has been colored and gilt throughout, and is a most beautiful piece of work in all respects, and one well worthy of the attention of modern copyists.

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I am able, also, to show you a purely classical organ from the chapel in the Palazzo Publico at Siena, a fine work of the celebrated Baldassare Peruzzi, about the year 1500. This instrument is likewise painted and gilt throughout, and there are several other refined works of Peruzzi, of similar class, in the Duomo and the Ospedale della Scala.

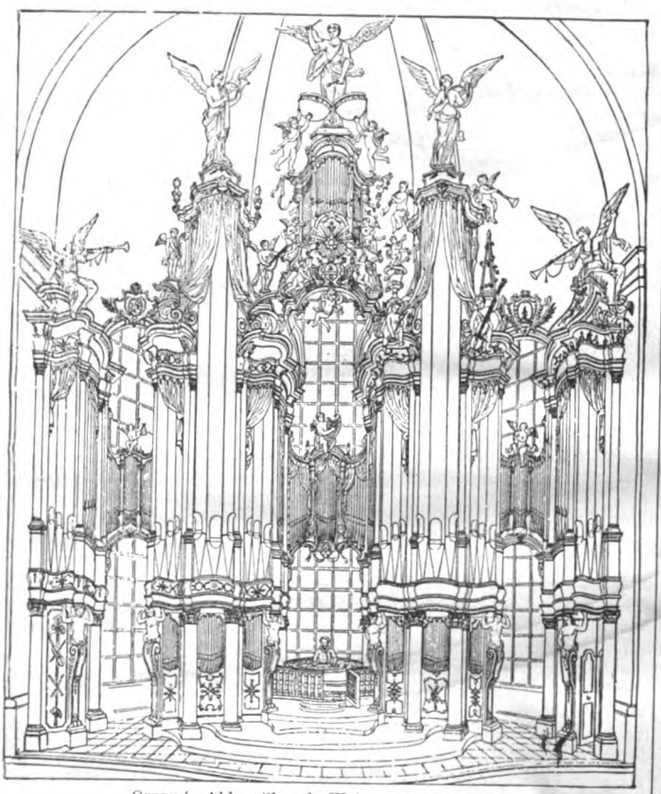
The last Italian example is that from the church of St. Maria di Carignano at Genoa. It was built in 1657 by Hermann, a Flemish Jesuit, who had the assistance of Italian artists for the carvings, paintings and gilding. Hermann probably designed the main case, which is rather northern in shape, while Italian details are sufficiently pronounced. The painted doors are highly picturesque, and are always shut when the organ is not being played. The weight of these appendages is skilfully borne by iron swivels and chains.



Organ in Centennial Hall, Sydney, N. S. W.

I must conclude this paper by reference to a few English organs which deserve more than slight attention. These are all comparatively late in date, but nevertheless of high artistic value.

The first I am able to exhibit is that now in Tewkesbury Abbey Church. This fine instrument was built in 1637 by Harris, the grandfather of Renatus Harris, for Magdalen College, Oxford, in the chapel of which it stood for a short time. During the Civil Wars it was, curiously enough, removed by Oliver Cromwell to Hampton Court, where, it appears, he used it for his own gratification. In 1660 it was restored to the College, where it remained in use till 1737, when it was sold to Tewkesbury Abbey. It is a most interesting and valuable specimen of Carolean architecture, and the richly-embossed pipes should specially be noticed.



Organ in Abbey Church, Weingarten, Germany.

The next example is the work of the same builder, the elder Harris, and now stands in a dilapidated state in the west gallery of Stanford Church, near Rugby. It is a charmingly designed organ with highly-enriched and embossed pipes. The case is of deal, and has been painted and gilded all over.

The last English specimen is from Finedon Church, near Wellingborough, in Northamptonshire. The organ was the work of Gerard Smith, and was built in 1717. This case is of a fairly common type, and there are some almost as good in the city churches, but this is, perhaps, the best of its date.

It does not require much examination to see that the ordinary modern organ-case will not bear any comparison whatever with even the least costly of those of which we have been talking. I have already shown how complete was the destruction of the Mediæval instruments here during the Rebellion, and how very few organs of any respectable age remain to us. But at the same time the process known as "restoration," which is a most laudable thing if carried out in a thoroughly conservative spirit, has done so much damage to old organs and their cases, that we have positively destroyed during the last forty years many which were erected at the momentous and interesting epoch of the Restoration of the Monarchy in England following the death of Cromwell. Nearly all our cathedrals possessed before the "Gothic revival" old organs of some kind or other, and many were enclosed in really splendid cases. These have been ruthlessly swept away, one after the other, and been replaced by sometimes better organs and always infinitely worse cases. Durham, Hereford, Worcester, Chichester, Peterborough and many others have gone forever; destroyed in deference to the fallacy of architectural uniformity which has proved such a bane to the art of past ages. On the Continent things have been quite as bad, for the reaction has set in here in England, while such is unfortunately not the case abroad, though signs of its advent are not wanting. And these remarks do not apply, of course, only to organs, but to every kind of work of past artists.

There still remain, however, some fine old organ-cases in the colleges at Cambridge and Oxford, in the churches of the City of London and several others in country churches.

The King's College organ at Cambridge has a grand case, dating from as early a period as 1606, which was built by Dallam, a famous artist of that period. The college accounts give a very interesting list of the charges incurred for building the organ, and erecting and decorating the case, the chased pipes of which were destroyed by Avery in 1804. Another fine case is that in Exeter Cathedral, the work of John Loosemore in 1665.

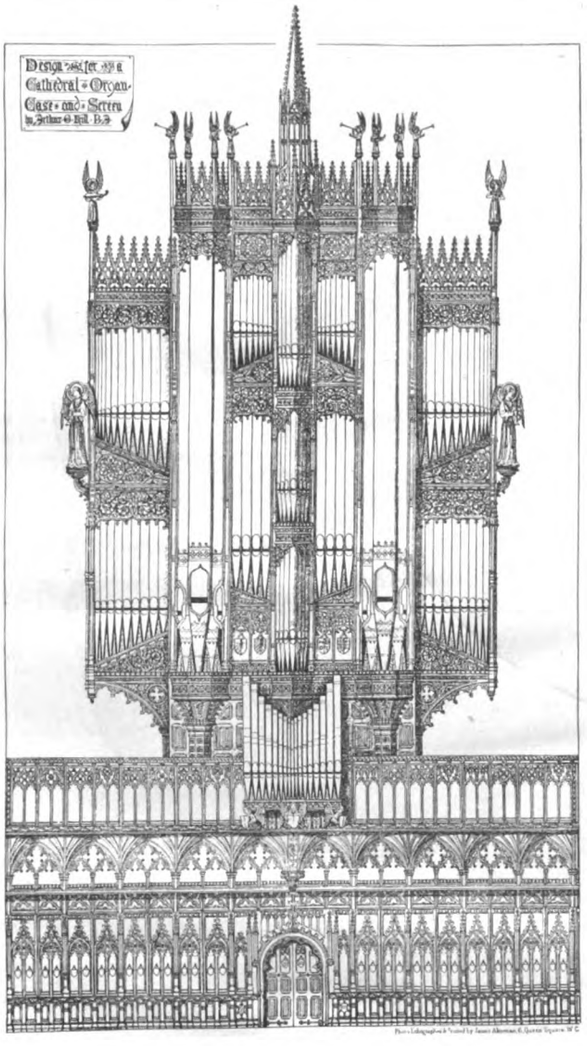
Let me conclude with expressing a hope that any of you who may have to work on an old church which contains an ancient organ, even if not so old as some of these just mentioned, will be careful of its venerable features, and not, to satisfy the desire for modernization, destroy the ancient case or front pipes. You can with ease obtain a grand new organ — certainly superior to any old one in tone and mechanical appliances — but you cannot replace the ancient and destroyed case, for a copy even, however exact, is but a modern reproduction, devoid of the charm and value which antiquity alone can give.

In the following illustrations, which have appeared in the *American Architect*, may be found representations of organs:

No. 54. Jan. 6, '77. Amherst College Chapel, Amherst, Mass. (Modern.)

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No.			
67.	April 7, '77.	First Church, Boston, Mass.	(Modern.)
127.	June 1, '78.	Central Falls Baptist Church, Lincoln, R. I.	(Modern.)
208.	Dec. 20, '79.	Oxford Presbyterian Church, Philadelphia, Pa.	(Modern.)
214.	Jan. 31, '80.	Grace Church, New York, N. Y.	(Modern.)
275.	April 2, '81.	Universalist Church, Waltham, Mass.	(Modern.)
277.	April 16, '81.	Church of the Redeemer, Bryn Mawr, Pa.	(Modern.)
313.	Dec. 24, '81.	St. Stephen's Memorial Church, Lynn, Mass.	(Modern.)
345.	Aug. 5, '82.	Presbyterian Church, South Orange, N. J.	(Modern.)
366.	Dec. 30, '82.	First Baptist Church, Cambridge, Mass.	(Modern.)
495.	June 20, '85.	Church, Wethersfield, Conn.	(Modern.)
564.	Oct. 16, '86.	First Spiritual Temple, Boston, Mass.	(Modern.)
644.	April 28, '88.	Emmanuel Baptist Church, Brooklyn, N. Y.	(Modern.)
732.	Jan. 4, '90.	Palace of the Trocadéro, Paris, France.	(*Int.*)
733.	Jan. 11, '90.	Church of the Good Shepherd, Gospel Oak, London, Eng.	(Modern.) (*Int.*)
734.	Jan. 18, '90.	Wesleyan Chapel, Leeds, Eng.	(Modern.) (*Int.*)
735.	Jan. 25, '90.	Hofkirche, Innsbruck, Tyrol.	(*Int.*)
770.	Sept. 27, '90.	Church of Holy Trinity, Reading, Eng.	(Modern.) (*Int.*)
770.	Sept. 27, '90.	St. Michael's Church, Framlingham, Eng.	(Modern.) (*Int.*)
788.	Jan. 31, '91.	Peddie Memorial Baptist Church, Newark, N. J.	(Modern.)
797.	April 4, '91.	St. Sepulchre's, Holborn, London, Eng.	(*Int.*)
809.	June 27, '91.	Neustra Señora del Pilar, Saragossa, Spain.	(Page 192.)
865.	July 23, '92.	Church of St. Mary, Bottesford, Eng.	(Modern.) (*Int.*)
906.	May 6, '93.	Trinity U. P. Church, Glasgow, Scotland.	(Modern.)
921.	Aug. 19, '93.	Grace Church, San Francisco, Cal.	(Modern.)



936.	Dec. 2, '93.	St. Luke's Church, Germantown, Pa.	(Modern.)
944.	Jan. 27, '94.	Congregational Church, Providence, R. I.	(Modern.)
952.	Mar. 24, '94.	Parish Church, Hampstead, London, Eng.	(Modern.) (*Int.*)
960.	May 19, '94.	French Protestant Church, London, Eng.	(Modern.) (*Int.*)

The case of the organ formerly in the Boston Music Hall was designed by Hammatt Billings, but the instrument was built in Germany. Dedicated in 1863, at which time it was the largest organ on this continent and one of the largest in the world, it was taken down in 1884 and is now the property of the New England Conservatory of Music, in Boston, which purposes to re-erect it in its new hall, yet to be built.

The largest organ in the United States is that in the Cathedral of the Incarnation, Garden City, L. I., the elaborately carved case of which is of mahogany, designed in Decorated English Gothic by Henry G. Harrison. It was erected in 1879-1883.

The largest organ in the world is in the Centennial Hall at Sydney, N. S. W., and was completed in 1890. The case was designed by Arthur G. Hill.

ART IN THE CITY OF LONDON.

AFTER several efforts to see the new mosaics, which the London atmosphere churlishly hid from our view, I must fain confess some disappointment. I had pictured to myself something of the effect of my first sight of San Marco, Venice, when, upon a sunny afternoon one autumn, I entered that, to me, unknown church, the sun streaming in and lighting up the whole apse in a blaze of golden light. Here, in London, the sun was shining pretty brightly, but no rays penetrated the haze in which the interior of the great cathedral is almost always enshrouded. How rarely one ever sees the pictures on the dome,—indeed, two persons, quite lately, have been astonished when I have spoken of these same pictures by Sir James Thornhill. However, that is not Mr. Richmond's fault; he has done his best; and if the atmosphere refuses to aid him in his effort to diminish the gloom of London's most gloomy church, it is no one's fault, but the climate's.

The subjects of the mosaics have been described; and it is undoubtedly true that the *quasi*-Byzantine style is much too early for Wren's church. Could not the artist have gone to the Renaissance for his inspiration? His "Christ in Glory" is of the character of the great figure at San Marco; his Angels are a cross between the Cherubim of Orcagna and the "Sons of God" by W. Blake. As for the design, the "Creation of the birds," upon one of the shallow domes, it is much too minute to be anything but a confused mass. Mr. Richmond studied the early Ravenna mosaics (slung up in a basket, it is said) to some effect: for, undoubtedly, they are far more luminous than the flat-surfaced ones by Salviati; the difference being that the cubes of the fifth-century work are of all manner of shapes, while those of the Murano mosaists are uniformly square. Mr. Richmond's designs have all been carried out by British workmen, a fact which gives great pleasure to the world here in London; but I confess to being very unpatriotic in this, as in all art and many other matters; and if a foreigner can do the work better than an Englishman, I see no objection to employing him. Whether Paris is happier in its new mosaics in the Louvre, is very doubtful — I fear not; they are decidedly gaudy and uninteresting, although the work of France's best artists. Where is the fault? Are we nineteenth-century people deficient in the bump of decorative talent? Who can answer? Perhaps Chicago can.

There is one noble example of architectural design to be seen in St. Paul's, a work equal to any of its kind in any country — equal to the great cinque-cento tombs in Italy, or the fine examples of French Renaissance at S. Denis — the monument of the Duke of Wellington. It is extraordinary how little was thought of Stevens in his lifetime, and with what pain and grief his work was accomplished. Let us hope that now we may soon see the completion of this grand monument, for it still lacks the Duke's effigy upon the summit.

The city fathers have arranged another exhibition at the Guildhall, as fine a one as its forerunners, and as interesting. Mr. Poynter's "Israel in Egypt" is once more in public, and Mr. Waterhouse's magnificent "Mariamne," which the catalogue explains as having been at Chicago in 1893, as if it were painted for that exhibition. They are worth comparing in their workmanship — the one hard and dry, the other rich and enveloped, to adopt a French phrase. But, in spite of its dryness, this early work of Mr. Poynter's is far more interesting than many of his later pictures. What is there about Mr. Herkomer's manner that always strikes one as unsatisfactory? Is it a want of distinction? The "Last Muster" treats of the commonplace; but so do Jules Breton's peasant subjects; likewise Dagnan-Bouveret's; yet the latter artists are always "*distingués*." So is Mr. Orchardson. A charming landscape "lent by the artist" seems to show that Mr. East's admirers do not always take away the right thing when they visit his studio. On the other hand, one of Mr. Dicksee's sweet sentimentalities meets with many admirers amongst a discerning public. Lady Butler is not a colorist — nor is she a De Neuville, or a Detaille, or a Morot; but any one who can draw a cavalry-charge as she has done ought to be a member of the body of artists which includes Messrs. Dicksee, Story, Yeames, and Company.

Two splendid portraits show Mr. Watts[1] and Mr. Ouless[2] at their best — both being very unequal artists. That the same man could have painted the portraits of Philip Calderon and Lady Garvagh is almost incredible. It is curious to compare these portraits with Mr. Whistler's study in gray, "Miss Alexander," the schemes of color are so different, but so are the works of Titian and the great Japanese. Our dear old friend "Sir Isumbras," by Millais, is here, and so is the "Finding of the Saviour in the Temple," also that clever "Lorenzo and Isabella," by the first painter — perhaps never excelled as a character sketch. There is a conscientious thoughtfulness about these pre-Raphaelite pictures, which, in spite of certain glaring mistakes, commends itself to our sympathies in these days of smudge and fog. If Holman Hunt and Millais, if Arthur Hughes and Madox Brown erred on the side of affecting an imitation of nature, which is impossible, our friends of these latter days who give us impressions of nature err on the side of dirtiness, fogginess and uglyness. If Mr. Grieffenhagen's and Mr. Fowler's "Eves" are true portraits of our first mother, we cannot be too thankful that we are no plainer than we find one another in these degenerate days; and is it not extraordinary that "Pandora," adorned with beauty by Aphrodité herself, should have been no pleasanter to look at than Rossetti has depicted her? Strange, indeed, must the men have been who were ruined by this ghastly lady in red with the shock-head. But the color, they say: the color; how exquisite!

PENGUIN.

[1] Portrait of P. Calderon.
[2] Mr. Bancroft.

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CANADA

THE PROPOSED COUNCIL OF ARBITRATION AND CONCILIATION. — ALLEGED DISCOVERY OF TIN. — ST. JAMES'S, MONTREAL. — IS AN EXCAVATION A FIXTURE?

THE Bill before the Ontario Provincial Legislature for the settlement of labor disputes reached its second reading since my last letter; the Attorney-general explained its provisions, which may be briefly summarized thus: The purpose of the bill is the formation of "Councils of Arbitration and Conciliation for the settlement of Industrial Disputes." It is founded largely on the Act of the New South Wales Legislature, which has proved effective, and has been adopted in British Columbia. The Act is simply permissive, and seeks to give effect to the awards found, to make them conclusive and enforceable by law. This principle has been adopted by the Imperial Parliament. In the State of Massachusetts the adoption by the parties to a dispute of the decision of the arbitrators is purely voluntary, but it is said masters and workmen very seldom refuse to act on the awards. Public opinion, the attorney-general said, was against the disregarding of the awards. It is proposed to establish two councils, that for conciliation to consist of four conciliators, two to be appointed by each party to the dispute. If unable to agree, these conciliators could have a reference to the council of arbitration which is to consist of three members, one representing the employers, one the employés, and the third to be appointed by the Governor-general. The proceedings are to be conducted in public. The parties may, by uniting, agree beforehand that the decision shall be binding and the award compulsory, but this is optional. This appears to be a considerable weakness in the bill, and one which may nullify its effect. It need not be compulsory for the parties to a dispute to appeal to a council of conciliation, but having appealed, having gone through with their case, and perhaps owing to disagreement among the "conciliators" had reference to the arbitrators, the arbitrators' award should be final and binding. Making the acceptance of the award optional to either party may result in leaving the dispute at the end of the proceedings exactly in the position it was before they were begun. The parties having agreed to submit their dispute to the Council, should do so, on the understanding that the award shall bind them, and only under such circumstances should the aid of the Council be invoked. The Bill is said to be favorably regarded by the workingmen of the Province generally, copies having been freely circulated among the various societies of workingmen, and employers are said to have raised no objection to it. But this optional clause looks like pandering to the workingman, an election-dodge in fact, as if the promoters said, "We will legislate for the benefit of the workingman, but we must not legislate so as to bind him to anything against his precious will." Exception was taken to the "cumbrous machinery" of the Bill, but, on the whole, it was well received. It is, no doubt, a move in the right direction, but if made at all it should be done firmly and without hesitation.

It has recently been reported from the Bureau of Mines that tin ore has been discovered in the mining district of Sudbury, Ontario. As to the quantity and quality, we still await details, and probably shall have to wait until investigation has been made. But the ore is described as occurring in a ledge of white quartz standing boldly out from the surface of the rock. Samples have been assayed and have proved to be cassiterite or tin oxide. The oxide occurs in crystals in the rock, but they do not show crystalline formation but are rather fragmentary, varying in size from a grain to a small bean. The importance of a good find of tin ore would be great and far-reaching. Tin, so far, is little known in Canada, or indeed, on this continent. Where in the United States discoveries of tin were alleged and means for their protection were taken, the result was considerable financial loss to those concerned, Mr. McKinley himself suffering largely through his own protective measures in this connection. Just because of its rarity, tin ore has been the basis for many fraudulent operations: "salted" tin specimens have caused an immense amount of loss, so that in this case it is well to remember the proverb that advises investigation prior to the indulgence of athletic performances.

The new great Roman Catholic church in Montreal, commonly called "St. Peter's," but actually named "St. James's," was recently opened for public service. So far as proportions can be adopted on a reduced scale, it is supposed to be a model of St. Peter's at Rome, but it is to be feared St. Peter's of Rome would hardly recognize itself in minature. In saying this I do not wish or intend to disparage the efforts of its authors, but, of necessity, details, such as doors and windows, which cannot be reduced in conformity with the reductions of length and breadth of the building, must be totally out of proportion in a model. The general effect, however, is very fine and the cathedral is an imposing structure. The foundation-stone was laid on the 28th of August, 1870, and Mgr. Bourget, the great ultramontane Catholic Bishop of Montreal, rejoiced in seeing his earnest desire take practical shape. The site was then fairly outside the city, but now it is the southern extremity of the most fashionable part, while from the brow of the eminence on which it stands, the church overlooks a densely populated district, chiefly inhabited by members of that body of the Christian Church who will look up to it as their haven of refuge and chief place of worship. Where open fields and orchards existed, when the stone was laid, now stand half-a-dozen other churches, great railway-stations and hotels, surrounded on three sides by the residences of the wealthy. The older Cathedral of St. Sulpice occupied the centre of the older city, and the newer St. James's, the centre of the new; farseeing must have been the projector of this scheme, and well have his prognostications been fulfilled. The new Cathedral is 333 feet long externally, 150 feet wide at its greatest width and 114 feet at its narrowest, while 116 feet is the width of the transept. The great portico has a façade of 170 feet and a depth of 30 feet; the extreme height of dome and cross is 256 feet. The interior is very much broken up with chapels, so that its seating accommodation is small as compared with the older church, but it was estimated that 4,000 people were present on the opening occasion. The older cathedral has two immense galleries each capable of seating 2,000 persons, while 4,000 more can be accommodated in the pews on the floor. The aisles are very wide and when packed with people standing in them, there have been as many as 16,000 persons present at one time. A feature of interest in the choir of the new church is the Archbishop's throne, presented by the priests of the diocese, at a cost of $1,300. It occupies the same position relatively as the Pope's throne in St. Peter's at Rome. It is of walnut with sculptured ivory and is surmounted by a statue of St. James. The high-altar is not yet complete, nor are the thirty altars the church is intended to receive in place. A great deal remains to be done, and it will probably be another year before services can be regularly offered there.

A very curious case has been before the Exchequer Court at Montreal. The Crown, in 1851, leased a large tract of land near Montreal for $1,000 a year, the lease renewable every twenty-one years, the site to be used as dry-docks, ship-yards, etc., the Crown to have the power to terminate the lease at the end of any of these periods of twenty-one years, and to take over the buildings and works to use in connection with the Lachine Canal, the value being settled by arbitration. The buildings, etc., appear to have been designated in the original lease as "fixtures." The present motion was to determine the meaning of "fixtures" in this particular case, the Crown claiming that an excavation (such as the dry-docks, etc.) is not a "fixture" under the Landlord and Tenant's Act. The case known as Grier *vs.* the Crown, was some time ago referred to Referee Mr. C. C. Gregory, of Toronto, for a report, the plaintiff suing for $150,000. The referee reported in favor of giving the plaintiff $50,000. Judgment was reserved, while Justice Burbridge considered whether "a hole" could be regarded as a fixture.

CONSTRUCTION.[1] — XXIII.

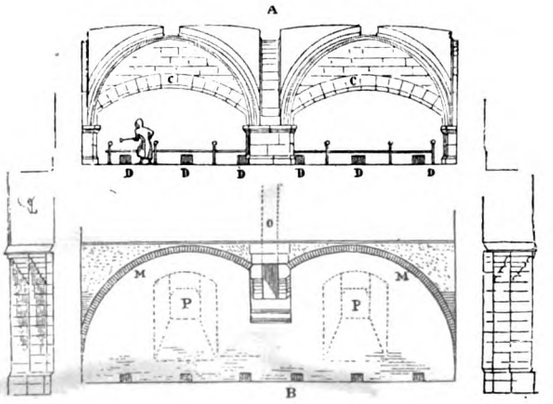


Fig. 123c.

AS architects, it is of small importance to know whether these hospitals, these colleges, these farm-houses were dependencies of abbeys or cloisters, whether these town-halls were frequently embargoed by the suzerains, whether these markets paid a tribute to the lord of the manor. These establishments existed, that is all we need to state; they were well arranged, well constructed, in a durable and thoughtful way; that we must acknowledge.[2]

[1] From the "*Dictionnaire raisonné de l'Architecture Française*," by M. Viollet-le-Duc, Government Architect, Inspector-General of Diocesan Edifices, translated by George Martin Huss, Architect. Continued from No. 915, page 23.

[2] The spirit of passion which causes the destruction of castles and even churches is comprehensible; but what is much more difficult to explain is the blind mania which has brought about in France during the last sixty years the demolition of numbers of very good civil structures, very handsome, very useful (for no other reason than that they were old and recalled a former age), simply to replace them by deplorable constructions which cost a great deal of money, although they were built in a parsimonious manner and are frequently decidedly ugly. Many towns have been deprived of establishments which would have been suitable for new uses, which would attract the attention of travellers and which, in short, did them honor.

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Let us take a few examples: let us examine the excellent arrangements of the great halls of the abbey of Ourscamp, of S. Jean-des-Vignes, Soissons, of Mont S. Michel-en-mer, and of the hospitals of Angers[1] and Chartres, which date from the end of the twelfth and the

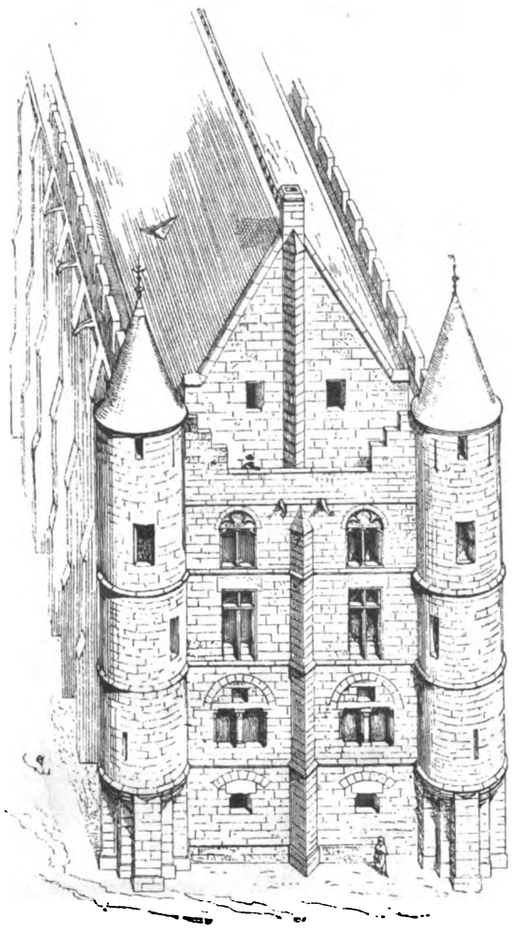


Fig. 123. Abbey of S. Marie de Breteuil, France.

beginning of the thirteenth century. Where shall we find better construction, better conceptions, more ample, more healthful, without needless luxury and which give a higher idea of the knowledge and practical sense of their architects?

The general view and details of some of these vast edifices having been engraved with minute care in the work of M. Verdier on civil architecture, we do not deem it necessary to reproduce them here; we shall give our readers a few constructions which have not before been studied and which have, at least, an equal importance with those mentioned. There exists in the Abbey of S. Marie de Breteuil, a

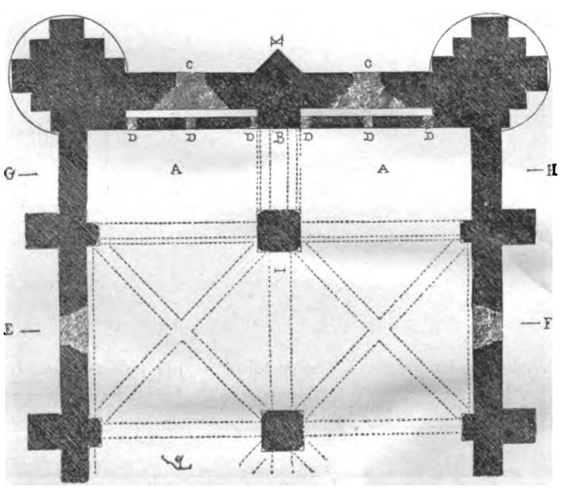


Fig. 123*a*.

vast building flanked by four turrets and crenellated, which could, if necessary, be defended. Its ground-floor contained the kitchens and their dependencies. The first story contained the dormitories of the guests of the monastery; the second a large infirmary; the third store-rooms for provisions and the fourth, under the roof, a granary for storing cereals. A lateral staircase passing across the buttresses and covered by a lean-to roof rose to the second story; the turrets at the angles had, in addition, winding staircases leading from one story to the other. This structure was not vaulted except the lower floor and under the roof; it is divided lengthwise by a range of columns. Lateral buttresses take the thrust of the vaults. Figure 123 shows the exterior aspect of this structure.[2]

We see the gable on which is built the huge kitchen chimney. A triangular buttress, like a ship's prow, gives strength to this gable wall in front of the chimney flue. In order to grasp this construction thoroughly, it is necessary to refer to the plan (123*a*) taken on the ground-floor level. The entire space *AA*, that is to say the last bay of the room, is occupied by the fireplace whose flue rises at *B* between two arches. At *C* are exterior openings communicating by a throat with the air inlets intended to give a vigorous draft to

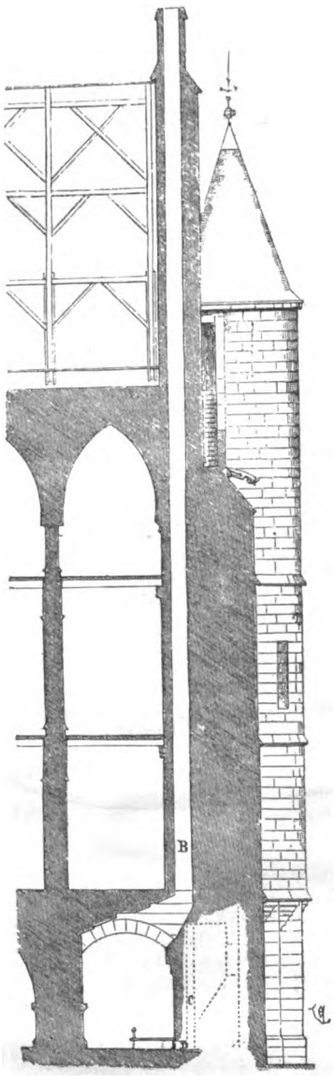


Fig. 123*b*.

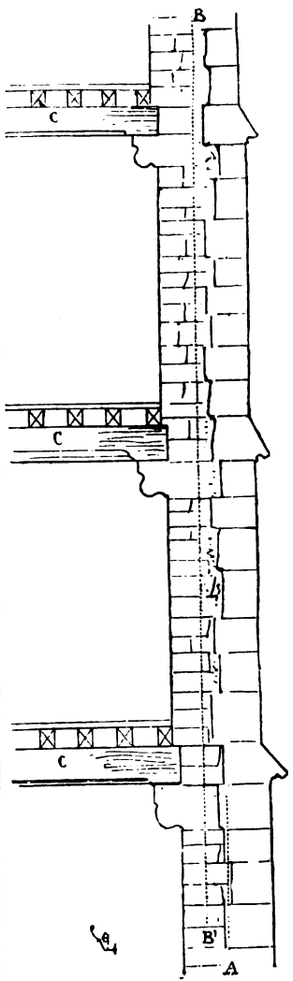


Fig. 126.

the fire built on an elevated grate and to establish a sufficient current of air to carry away the smoke into the central flue. Figure 123*b* made on the line *IK* of the plan, shows us at *B*, the chimney-flue, at *C* the throat with its exterior opening, and at *D* the air-inlets. It will be observed that the pathway around the battlements is not interfered with by the turrets and the gables, but, on the contrary, that this pathway is continuous across the gables on a lower level. Figure 123*c* shows at *A*, the section of the ground-floor on the line *EF* of the plan and at *B* this section on the line *GH*. In the section *A* are shown at *C* the arches which form the hood of the chimney divided by the large pillar; at *D* the mouths of the air-inlets with the elevated grate. In the section *B* the arches *M* which form the soffit of the chimney are of brick and the flue is shown by the dotted lines at *O*. The dotted lines also show at *P* the two air-intakes intended to supply the inlets by the throat behind the brick wall which forms the back of the fireplace. The cross-section, (Fig. 124) looking toward the gable opposite to the chimney, completes the description of this fine and simple construction. At *A* is shown the lateral staircase which leads up to the second story through the buttresses, which

[1] See "*Architecture, Civil and Domestique*," de Mm. Aymar Verdier et Cattois.

[2] See "*Monog. d'abbayes.*" Bib. Sainte Geneviève.

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are given greater projection in order to provide for it. The windows *B* of the third story used for store-rooms are pierced in the gable on the level of the interior flooring so as to facilitate the hoisting up, by pulleys supported on exterior brackets, of the things to be stored. Similarly the openings *C* are pierced on the level of the floor of the garret. The thick side walls preserve an equable temperature in the interior; the ventilation of the stories could easily be managed, by means of windows opened in the four main walls on all sides of the isolated building. The buttresses enclosing the walls dispense with all transverse anchorage and this the more naturally because the inner face of the walls frequently overhung the story below, as shown in the transverse section, Figure 124.

This was a means frequently employed to give the walls an inclination inwards and is, in fact, an excellent principle of construction whenever one is able to give to the base of the walls, sufficient thickness to guard against danger of buckling. It must be remarked, nevertheless, that habitually the intermediate girders (see the transverse section) do not tie together the bearing or side walls [*murs-gouterots*]; observe how the ends of the girders on the intermediate columns are arranged. At each story the supports are furnished with a cap *A* (Fig. 125), projecting only under the girder ends. Consequently the bearing walls exert a pressure on these girders and not a pull.

We cannot follow this plan in our modern constructions, but it is not without its advantages, and the Greeks in ancient times, much earlier than the epoch we are considering, had followed it in building their temples. If the mediæval architects followed the laws of equilibrium, whose importance we have endeavored to show, in building the vast vaulted edifices carried on isolated supports, they, at the same time, sought to obtain the concentration, the resultant of all the forces acting toward the centre of their edifices, in such a way that all the parts had a certain disposition to reciprocally buttress one another.

In civil constructions, where vaults play only a secondary rôle, where the floors present horizontal and rigid surfaces at different heights, the constructors adopt methods of building which act from the outside inwards against these rigid surfaces. They reached this result by the arrangement of the general plan and special details of construction. For instance, they give the walls an interior overhang, as we have just mentioned, and they build these walls of large

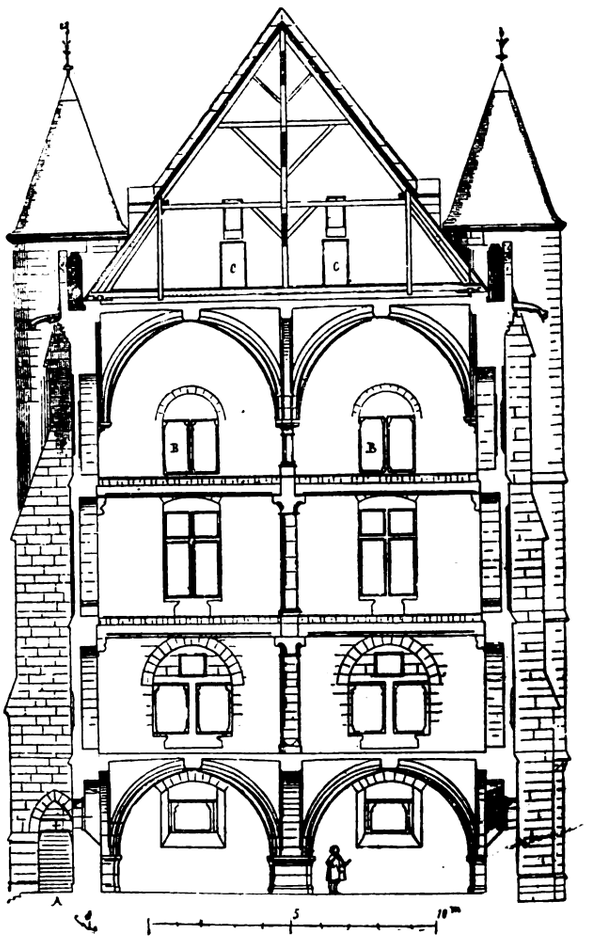


Fig. 124.

stones on the outside and with courses of less height, or with rubble on the inside.

Take, for instance, the section of a wall *A-B*, intended to carry the girders (Fig. 126); the outer face of this wall will be composed of relatively high courses of stone not bonded, and each story, separated by a stone belt-course, will be set a few centimetres farther back than the one below. The interior face, on the contrary, will be laid with thinner stones and each story will overhang the one below. Therefore, this wall will have a tendency to lean inwards — first,

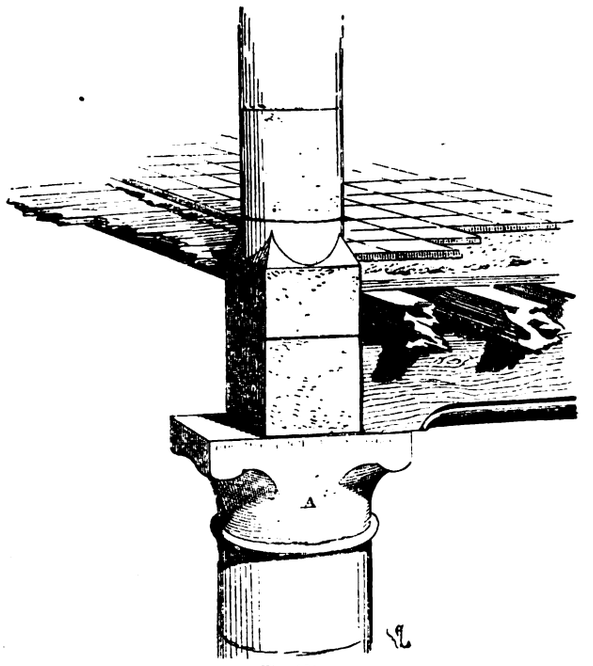


Fig. 125.

because its axis *B* will fall at *B'*, inside the lower axis *A*; second, because the exterior face will offer a less compressible surface than does the interior face. Thus, this wall constructed in this manner will exert against the ends of the girders *C*, a more powerful pressure in proportion as these girders are elevated above the ground. It would be, therefore, superfluous to tie the walls, which instead of tending to spread, will have on the other hand, a tendency to incline inwards.

This example shows that while the civil construction of mediæval times has its own individual character, distinct from religious construction, the architects, nevertheless, endeavor to replace in one as in the other inert masses by acting forces. In the civil constructions, the floors are considered as braces placed between walls which tend toward one another. Thus these floors are stiffened by the pressure of the walls and the whole mass of the building shows great solidity in consequence of these pressures against a system of braces.

[To be continued.]

SOCIETIES

THE ARCHITECTURAL LEAGUE OF NEW YORK.

THE last regular meeting and dinner of the League, previous to the summer adjournment, will be held at the club-rooms, on Wednesday, June 6, 1894.

The committee on current work announces that Mr. F. Wellington Ruckstuhl, Secretary of the National Sculpture Society, will deliver an address on "The New Sculpture Movement, and how the Architects may aid it."

The committee on Monthly Exhibitions announces an exhibition of a series of drawings made by Mr. K. Dahler-Tangen, during a three years' course of study at the Vienna Academy of Fine Arts, under the instruction of Baron Th. V. Hausen.

Since the last announcement the following have been elected members of the League — Messrs. Victor E. Rondel, Frederick Wilson, William W. Ferguson, J. A. Holzer, Henry Otis Chapman, Frank Vincent DuMond, and Guy Carlton Hunt.

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

LOWER STORY OF HOUSE OF W. E. ROOSEVELT, ESQ., NO. 804 FIFTH AVE., NEW YORK, N. Y. MR. W. H. RUSSELL, ARCHITECT, NEW YORK, N. Y.

[Heliochrome, issued with the International and Imperial Editions only.]

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COMPETITIVE DESIGN FOR THE HILLSBOROUGH COUNTY (N. H.) FARM BUILDINGS. MESSRS. HOWARD & CAULDWELL, ARCHITECTS, NEW YORK, N. Y.

The conditions of the problem are briefly as follows: the buildings, five in number, are to be located on a narrow strip of land between the railroad and highway, with accommodations for 250 paupers, 150 insane, 100 criminals; also an administration building for superintendent and family and 20 officers, and a boiler-house for heating the entire establishment. The buildings are to be of brick, with mill-construction throughout.

AMERICAN TRACT SOCIETY'S BUILDING, CORNER NASSAU AND SPRUCE STREETS, NEW YORK, N. Y. MR. R. H. ROBERTSON, ARCHITECT, NEW YORK, N. Y.

The building will occupy a lot 94′ 6″ x 100′ 7″. The main portion of the building will be 20 stories high, there being three additional stories in the roof of the front portion, the 23d story being used as a restaurant. The material will be granite, up through four stories; above, limestone, terra-cotta and brick. The cost of building is estimated at $1,000,000.

HOOK-AND-LADDER HOUSE, NO. 1, WARREN SQUARE, ROXBURY, MASS. MR. E. M. WHEELWRIGHT, CITY ARCHITECT, BOSTON, MASS.

"CHINATOWN," SAN FRANCISCO, CAL. SKETCHED BY MR. C. R. MITCHELL.

[Additional Illustrations in the International Edition.]

THE COLUMBIA FOUNTAIN, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. FREDERICK W. MCMONNIES, SCULPTOR.
[Gelatine Print.]

DOORWAY OF THE CHURCH OF ST. OURS, LOCHES, FRANCE.

This plate is copied from *La Construction Moderne.*

INTERIOR OF THE GERMAN PAVILION, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. PROF. GABRIEL SEIDL, ARCHITECT, MUNICH, BAVARIA.

This plate is copied from *Deutsche Bauzeitung.*

THE WEST TOWERS OF THE CATHEDRAL, SANTIAGO, SPAIN: AS SEEN FROM THE CLOISTER.

This plate is copied from *Building News.*

DESIGN FOR A FRIEZE BY MR. PATON WILSON.

This plate is copied from *The Builder.*

ADELPHI BANK, LIVERPOOL, ENG.: THE PORCH. MR. W. D. CAROE, ARCHITECT.

NEW OFFICES, *Northern Daily Telegraph*, RAILWAY ROAD, BLACKBURN, ENG. MESSRS. STONES & GRADWELL, ARCHITECTS.

This building, which we illustrate in our present issue, has just been completed for the Northwestern Printing and Publishing Company, Limited. It occupies a most convenient and commanding site close to the principal entrance to the railway station. The buildings are admirably arranged for the purposes for which they are erected. On the ground-floor very commodious accommodation is provided in the shape of a large general office for the transaction of public business, private offices for the managerial, editorial and reporting staff, with cloak-rooms and all other conveniences in connection therewith. The main entrance is at the corner of the building, as shown in the drawing. On the same floor, and approached from the side street, is a very large machine-room and rooms for the receiving and despatching of parcels, etc. Leading from the machine-room is a convenient office for the supply of papers to the news-agents' and news-boys' rooms; these rooms have separate entrances from the back street. The first floor is occupied by a very commodious compo-room, stereo-room, office, and other conveniences. The basement is very extensive, and contains large paper and other stores, damping-room, boiler-house, fan-room, dynamo-room, etc. This floor has separate entrances from the back roads. The elevations are of Accrington bricks, with buff terra-cotta dressings from Burmantofts, Leeds. The dome of the tower is covered with copper. The building is fireproof, and the construction throughout is of the best possible character. The machinery and other fittings are of the most modern and approved make. The total cost is about 20,000*l.*

COMMUNICATIONS.

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

THE VERDICT IN THE CASE, ROTCH *VS.* FRY.

BOSTON, MASS., May 19, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In publishing the judge's charge of the case Rotch *vs.* Fry, can you not insert for our vindication that the judgment was (plus costs) in our favor? I think, attention being called to our having to go to law for fees, we should have it known that our grounds for so doing were legitimate in eyes of the jury, and our position as architects sustained by the judgment. The case is entirely settled and we have been paid our bill in full, plus interest and costs.

Yours truly, ARTHUR ROTCH.

[Our correspondent properly calls attention to what is analogous to that lack of correlation between editorial and news columns which is more common in the daily papers than in ours. The fact is that at the time of writing the editorial paragraph, we were under the impression that the decision had been appended to the charge and that it was not necessary to repeat the statement. We regret this oversight all the more, since, as we learn, it has subjected our correspondent to an annoying amount of correspondence. — EDS. AMERICAN ARCHITECT.]

EXHIBITIONS

BOSTON, MASS. — *Several hundred Specimens of Textile Designs of all countries, from the second century to the present time, from the collection given by Denman W. Ross; also the Shirasee collection of Japanese Art:* at the Museum of Fine Arts.

Exhibition of New Tiffany Glass ware: at the Galleries of Williams & Everett, 190 Boylston Street, May 21 to June 2.

CHICAGO, ILL. — *Annual Exhibition of Water-colors:* at the Art Institute, May 6 to May 27.

CINCINNATI, O. — *Exhibition of the Cincinnati Art Club:* at the Art Museum, May 17 to June 30.

NEW YORK, N. Y. — *Twenty-sixth Annual Spring Exhibition:* at the Metropolitan Museum of Art, opened May 8.

Exhibition of the Competitive Designs for the Decoration of the Oyer and Terminer Court-room: at the Century Club.

Group Exhibition by American Painters William M. Chase, J. Alden Weir, Childe Hassam and others: at the Galleries of the American Fine Arts Society, 215 West 57th Street.

NOTES AND CLIPPINGS

A PLAUSIBLE THEORY OF RAIN-MAKING TO BE TRIED. — In spite of all the cold water which Secretary Morton has poured on the science of rain-making, the spring has no sooner arrived than there are indications that the experiments of last year are considered a scientific success and will be resumed this year with renewed vigor. The first notes of preparation are heard from Chicago and from the officials of the Rock Island Railroad Company. This company's road traverses Western Kansas in two directions, branching out from Topeka, one line skirting the northern part of the State and the other running directly to Montezuma in the southwest corner. These two lines of railroad run through a section of what was formerly called "the Great American Desert," part of which is in Eastern Colorado. The farmers in this country have always suffered for the want of rain. The Rock Island Railroad last summer set one of its employés to rainmaking. This was C. B. Jewell, the company's train-dispatcher at Goodland, not far from the Colorado line. His efforts were astonishingly successful, both in Kansas and in Colorado. Mr. Jewell's method is the one invented by Louis Gathman of Chicago, whose theory is that rain is never produced naturally except by the vapors of the atmosphere becoming agitated and mixed with the colder upper strata of air. He, therefore, fires up into the air metallic bombs filled with liquefied carbonic-acid gas. When these bombs explode the liquor expands instantaneously into gas, producing intense cold and immediate precipitation. Mr. Jewell will give the people of the West an ample opportunity this summer to enjoy the benefits of this discovery. — *Chicago Tribune.*

THE TRADE IN FLINTS. — The oldest industry in Great Britain — older it could hardly be, for its existence has been traced back to the pre-historic Stone Age — is still being carried on at the village of Brandon, on the borders of Norfolk and Suffolk, and is reported to be in a flourishing condition. It is a manufactory of gun and tinder-box flints. The work is done in little sheds, often at the back of townfolks' cottages. It will naturally be asked, "Who wants tinder-box-flints and gun-flints in these days of phosphorous matches and Martini-Henrys?" The answer to the first question is that there is a good trade in tinder-box-flints with Spain and Italy, where the tinder-box still keeps its ground in very rural districts. Travellers in uncivilized regions, moreover, find flint and steel more trustworthy than matches, which are useless after they have absorbed moisture. Gun-flints, on the other hand, go mostly to the wild parts of Africa, where our old friend "Brown Bess," sold by auction long ago for what flint-muskets would fetch, has found, it seems, her last refuge. — *London News.*

NEW STYLE OF RESERVOIR. — The City of Bordeaux has adopted a new species of reservoir, which deserves to be well known. It is entirely constructed of metal above the ground, and is the invention of M. Gerard, the municipal engineer, who was led to the contrivance by the necessities of the case. The ground being soft, the foundations were secured by sinking blocks of concrete and building piers of masonry on them. Iron columns standing on broad feet, are supported by the piers, and carry the girders on which the basins are built. There are two basins in the reservoir, which is over 120 feet long, by 50 feet wide, and they are covered by a metallic roof which is dust-proof. — *The London Globe.*

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HOOK AND LADDER HOUSE No 1
· WARREN SQUARE ·
EDMUND M WHEELWRIGHT CITY ARCHT.

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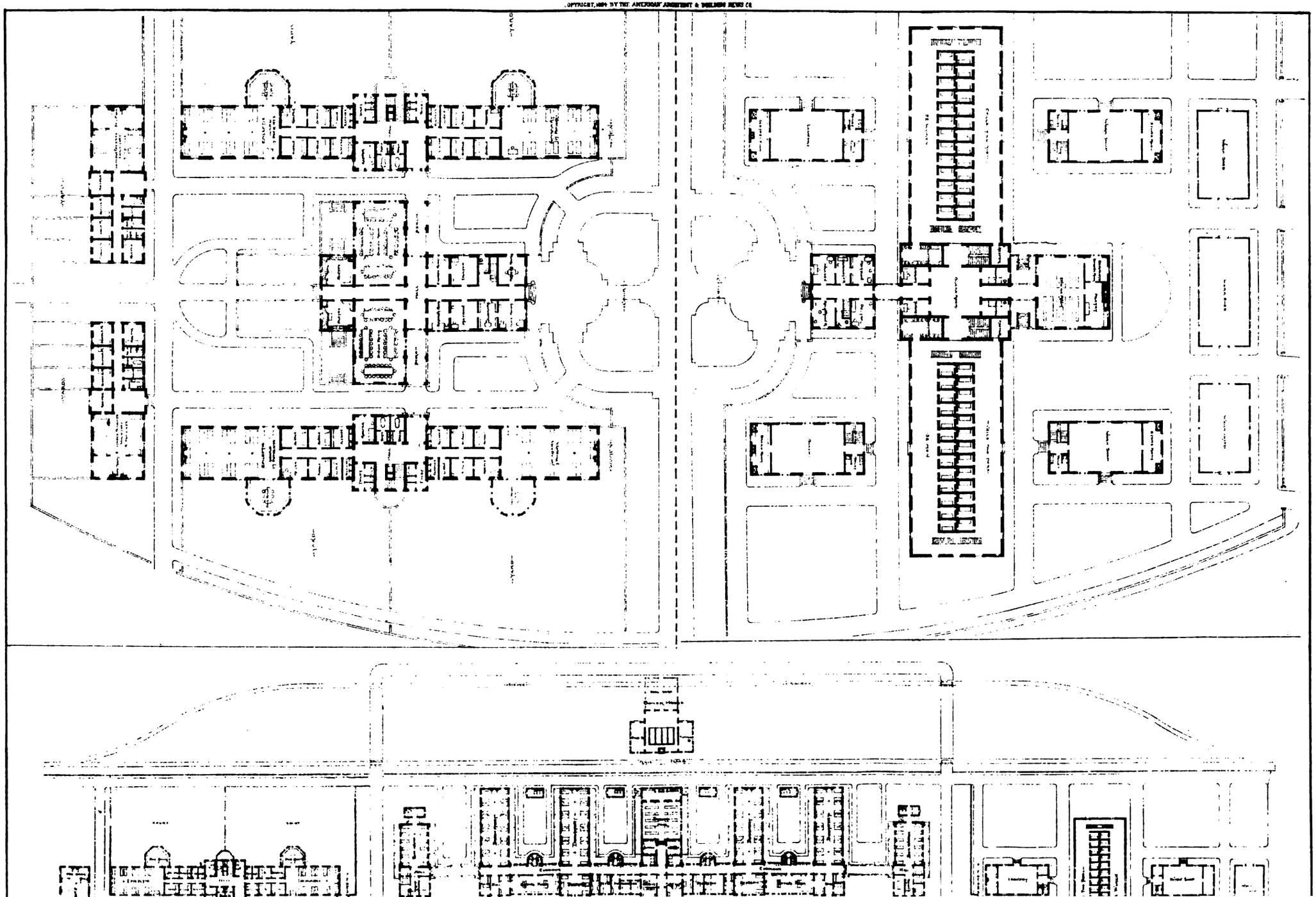
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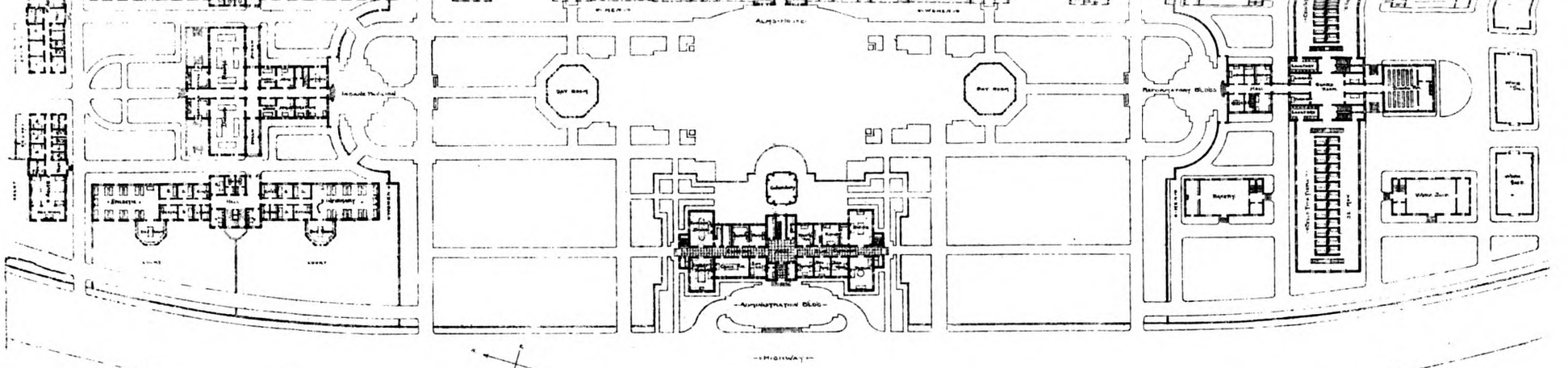
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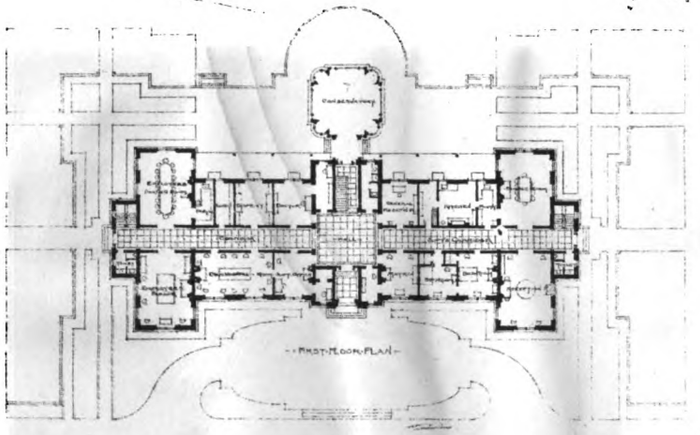
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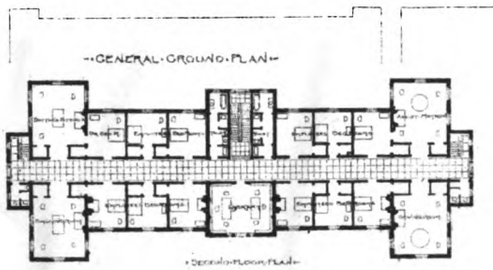
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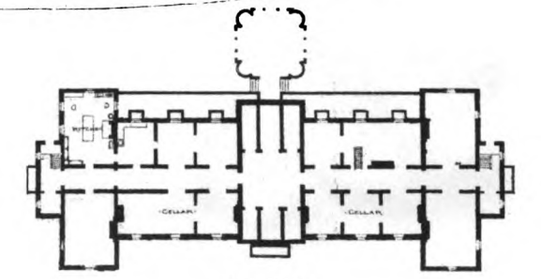


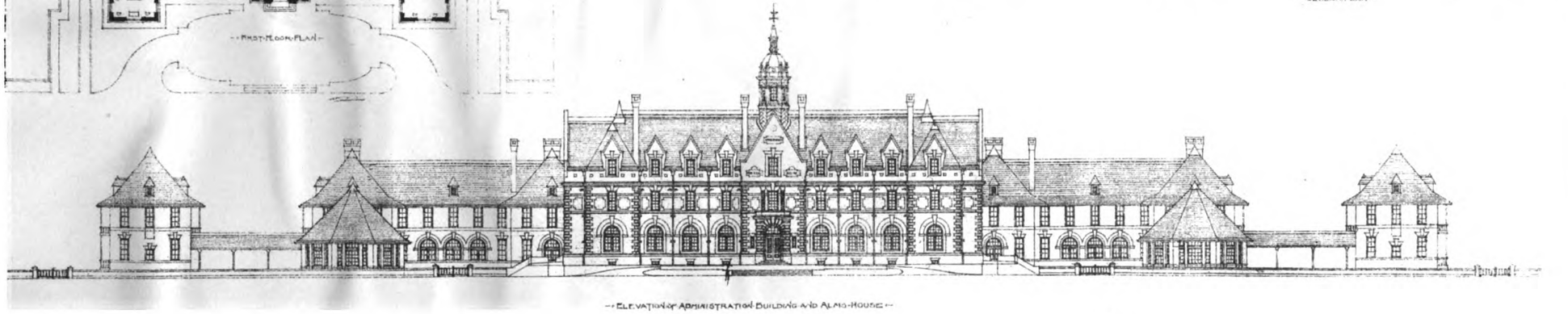
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COMPETITIVE DESIGN FOR HILLSBOROUGH COUNTY (N.H.) FARM BUILDINGS.

HOWARD & CAULDWELL, Architects.

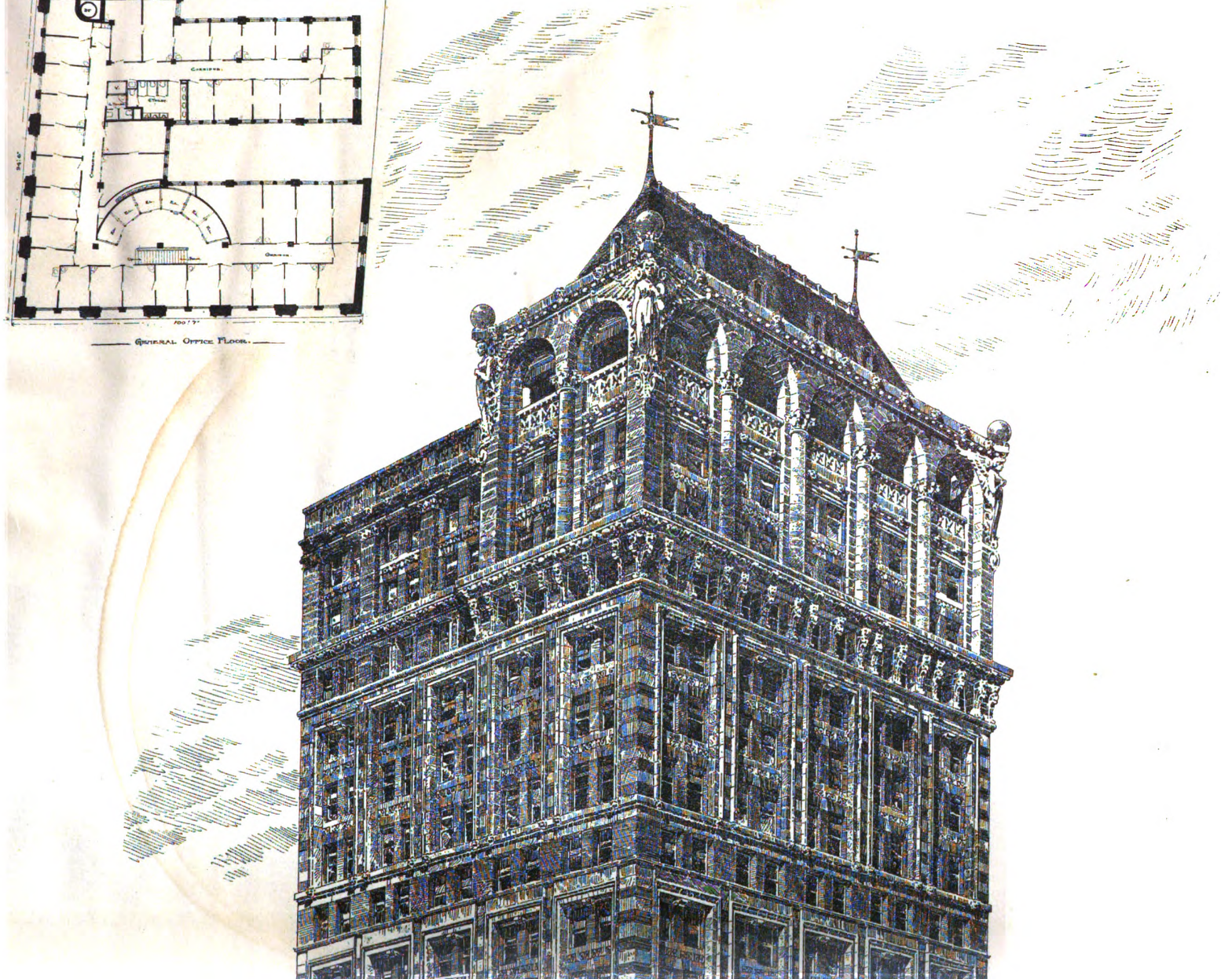
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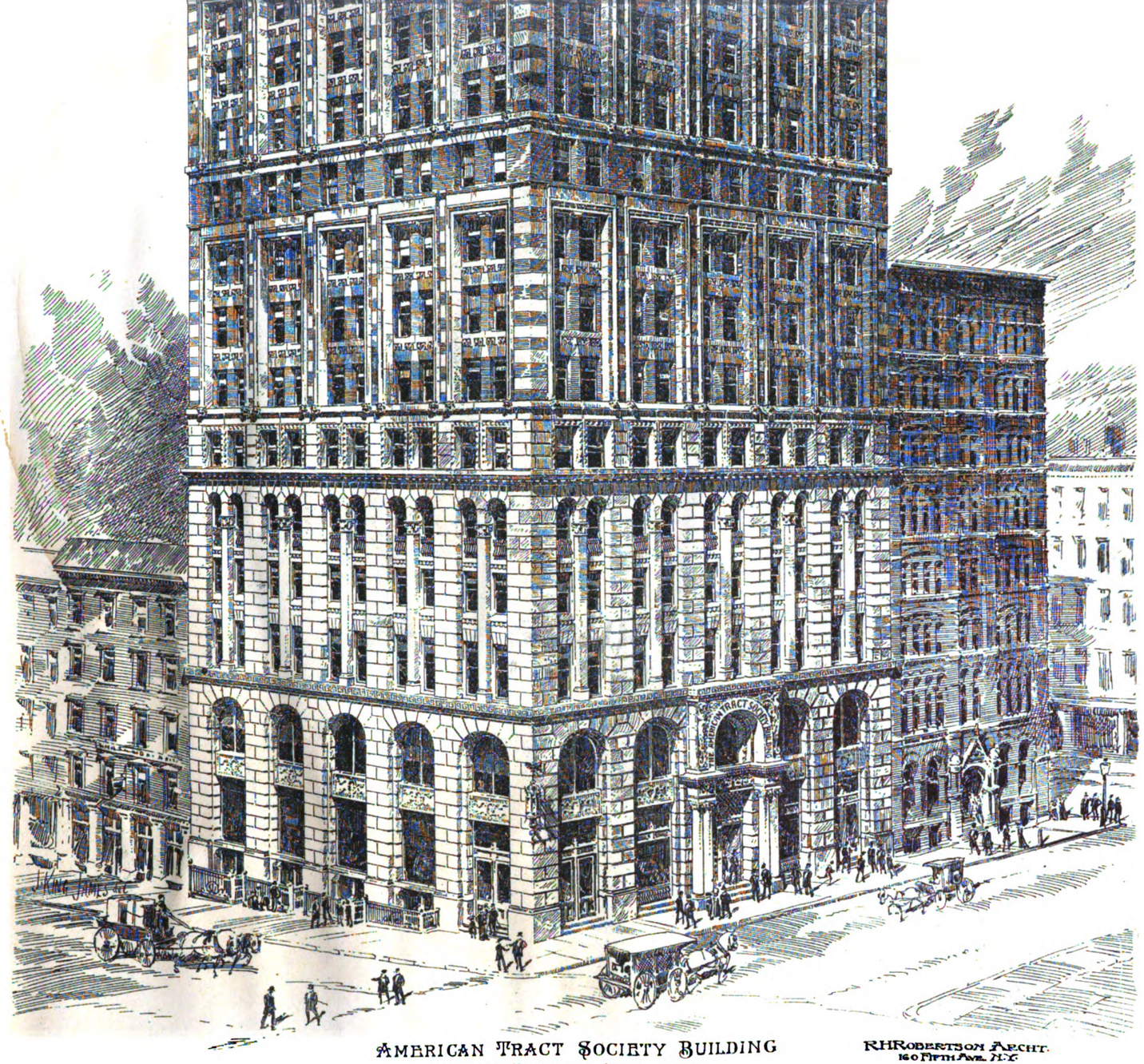
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AMERICAN TRACT SOCIETY BUILDING

S.E. COR. NASSAU AND SPRUCE STREETS.

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JUNE 2, 1894.

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MOST of our professional readers have probably received a document from the Secretary of the Institute, calling their attention to the necessity for immediate and vigorous action in calling public attention effectively to the question of the design for Government buildings. It will be seen, from the report of the Acting Secretary to the House of Representatives on the subject, that the Treasury officials have been, to a certain extent, driven to the wall by the persistent representations of the Institute Committee, backed by the unanimous support of the public press. The Burnham-Carlisle incident appears to have been a desperate dodge on the part of the Government officials to escape from that position; and, so far as the Institute Committee is concerned, it was a successful one, for the Institute will hardly consider it proper to expose its earnest and hard-working officers a second time to such treatment. The matter must, therefore, be placed in the hands of the entire body of the profession, and it is for all architects, now, to put forth their individual efforts to place the matter before Congress and the public, and to bring as much aid to the cause as possible, and in the shortest practicable time, in order that the desired result may be accomplished while the matter is fresh in the public mind, and before measures are adopted which will increase the difficulty of bringing about the desired reform. There is no doubt that a strong and skilfully-directed effort is being made at Washington to secure the repeal of the Tarsney law, or the adoption of amendments which would render it practically inoperative. It must be remembered that the Supervising Architect's office is, in its way, a great power in Washington. Its hundreds of clerks, computers, draughtsmen, designers and so on, nearly all of whom are permanent residents of the city, and who are little subject to change or displacement, form an important factor in Washington society. They have the immense advantage of being on the ground, where they have at all times the ear of Congressmen, and can watch from day to day for a favorable opportunity for bringing up the measure that they advocate when an unusual number of members known to be opposed to it happen to be absent from their seats. Many a bill, favored only by a minority of both houses of Congress, has been forced to enactment in this way, and it may be presumed that the employés of the Supervising Architect's office, who feel that the question of retaining their comfortable positions depends upon what they can now accomplish by legislation, will make the most of the chances that fortune may afford them.

IN trying to secure the help of Congress to keep them in their places, they have powerful outside assistance. To say nothing of the attitude maintained by the present Supervising Architect, the office, as a whole, is intimately connected with a host of contractors, local superintendents and assistant superintendents, postmasters, collectors and other officials, in all parts of the Union, who have occasional favors to ask of the Government architectural office, and are not indisposed to do a favor in return. A hint from these officials, in the ear of a Congressman, will often have more effect upon his vote than the clamor of a hundred newspaper editors, and the hint is, in many cases, ready to be given whenever it is wanted. There is no question that a very large majority of the intelligent people of the country wish to see the Supervising Architect's functions reduced to the lowest practicable dimensions, and the design and construction of the Government buildings entrusted to those who have shown themselves, by their conduct of private building operations, best qualified to undertake such work with credit to the country and themselves; but this wish of the majority is not a very violent sentiment, or a very clearly defined one, and the people who support, with resolution and skill, precise and definite views of a contrary nature are likely, for a long time, to see their views prevail, unless the vague feeling opposed to them is given point and direction, and supplied with a definite object, and definite data, by the effort of those qualified to present these.

WE have received an invitation to give "the widest possible publication" to a prospectus of an "Art Exhibition," to be conducted next winter in Boston by an enterprising dry-goods house. Although we see no particular objection to acceding to the request, it seems to us that there will be time enough to say more about it when the project has advanced a little further. Several substantial prizes are offered, a good jury on admission has been secured, and the size of the pictures is restricted within moderate limits, no canvas covering more than fifteen square feet being admitted. Presumably, the affair is intended, above all, to make money for the enterprising house in question, but it is quite possible to make money honestly, and in such a way as to benefit other people; and, as New England artists do not find their path strewn with many pecuniary roses, it may be hoped that the exhibition, by introducing them to the public after this rather novel method, will prove a benefit to them as well as to the public. All the pictures must, by the conditions of the programme, be on New England subjects, and the artists must have resided in New England at least one year previous to the date of their schedule of entry. This stipulation has, at first, a rather theatrical effect; but, although it was probably intended to appeal to the *chauvinism* of the New England public, we are not sure that it will not bring unexpected advantages. It is quite time that the American lovers of pictures were treated to something else than scenes in Brittany or Normandy, or "Oriental" subjects. There is enough in the subjective and objective life of New England to furnish motives for a whole museum of pictures; and it will be good for the artists, and good for the public, to have criticisms of the New England scenes made by people who have lived all their lives among those scenes.

THE death of Captain Jablochkoff, once a conspicuous figure in electrical science, took place a few days ago in Saratov, Russia. Captain Jablochkoff was born in 1847, and educated at the military engineering school in St. Petersburg. After graduation, he was appointed to the corps of sappers and miners, but soon resigned, to enter the service of the Moscow-Kursk Railway Company. He was assigned to the direction of one of the telegraphic stations of the Company, and, in the course of his experiments, devised the well-known type of arc electric-light, called from him the Jablochkoff candle, which was for several years in extensive use, and has not yet been entirely superseded. The Jablochkoff candle consists of two carbon rods, side by side, separated by a thin stratum of non-conducting and nearly infusible substance. The lower ex-

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tremities are connected with the wires carrying an alternating current, and the upper ones are at first connected by a bit of graphite. When the current is turned on, the graphite carries it across from one candle to another. The graphite is quickly burned away, but the current, once established, forms an arc, which slowly consumes the carbons, at the same time dissipating the insulating material in its way, so that the whole burns, like a candle, downward from the top until it is consumed. By using an alternating current, the carbon burns equally, and the Jablochkoff candle was, at the time of its invention, perhaps the only device by which alternating currents could be advantageously used in producing and regulating the arc light. Now, many devices are in use for the same purpose, and the Jablochkoff candle, which gives an unsteady light, owing to the variations in volatility between different portions of the non-conducting septum, is less in favor. Nevertheless, the invention was a very clever one, and Captain Jablochkoff well deserved the great reputation that it gave him.

PERHAPS the most lamentable calamity that has befallen mankind within the last quarter-century is the successful strike of the coal-miners' organization last year in England. Of course, there is nothing to regret in the fact that a large body of men should have been able to get more pay for their work than was offered them before the strike, for, within certain limits, it is desirable that every one should be able to enjoy the comfortable and healthy life for which a liberal income is requisite; but it is to be lamented that a comparatively small body of men, only, should have been able to secure this blessing, and that they should have secured it by the forcible oppression of people poorer and more needy than themselves. This triumph of skilful organization over unorganized poverty has been hailed with pæans of joy by those persons whose vast intellect can concern itself only with Organizations, and Governments, and Communes, and Nationalism, and Collectivism, and so on, but fails to grasp the details of the individual, the hungry children and the bread and butter; and it is needless to say that the lesson has not been lost on the practical "organizers" of this country. A coal strike, in imitation of the English one, soon occurred, accompanied by assaults on non-union miners of a particularly violent and wanton character. Miners' strikes in the West, also with dynamite and shot-gun accompaniment, followed; and it is now reported that "trusted organizers" are prowling around the Eastern States, with the object of securing a general strike of iron-workers throughout the country in the course of the summer. Judging from the methods which are coming into fashion among the labor organizations, it looks as if the time were approaching when sixty-five millions of people would have to choose whether they will have their lives and property kept in constant peril by a few hundred thousand union workingmen, led by a score or so of malignant schemers, or will resolve upon a decisive struggle to determine whether American citizens, of full age, shall have the right to work for whom they choose, and on such terms as they see fit to accept, without asking the consent of an Irish or German demagogue, and without incurring the risk of being shot, or blown up with dynamite, if they venture to dispense with that consent.

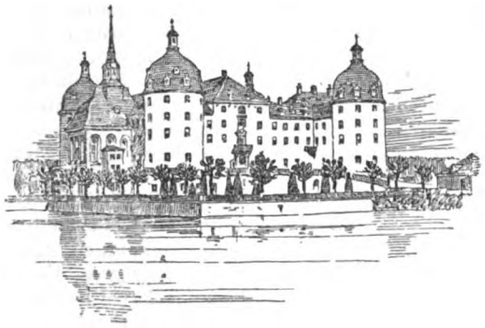
A NOVELTY in house decoration has been introduced in France, under the suggestive name of "*peinture express.*" Judging from the sample before us, the "express painting" is a form of paper-hanging. A paper, covered with a smooth ground, apparently made of some sort of gum, is printed with designs, after the manner of wall-papers, but in oil-colors, instead of the ordinary size-color. To apply the decoration, the back of the paper is moistened, and the rolls are then glued, back upward, on the wall to be decorated, with strong glue. The back of the paper is well worked over with a rubber "squeegee," to press out the superfluous glue, and insure adherence, and the whole left to itself to dry. After it is thoroughly dry, ordinary paste is spread over the paper, which, of course, has the back outward, and the work again left for an hour. At the end of this time, the paper will be softened, and nothing remains but to strip it off, beginning at one corner, and pulling gradually, when the oil-painted pattern will be found firmly adhering to the wall or ceiling. The marks of glue can then be washed away from the decoration, and the whole varnished if desired.

A HOAX, of a kind very unusual abroad, was perpetrated recently by one of the French newspapers, which announced, with circumstances apparently furnished by some person with a tolerable knowledge of geology, the discovery of a diamond-bearing stratum in the coal-regions of the Channel coast of France. The story was investigated, and proved to be without foundation. *Le Génie Civil*, in mentioning the affair, with merited disapprobation, gives an interesting account of the real nature of the formation of diamonds, which, since the opening of the South African mines, is much better understood than it once was. The account is borrowed from a paper communicated to the Academy of Sciences by M. J. Worth. Contrary to the usual opinion of chemists, M. Worth considers it proved that the diamond is formed at a high temperature. The fact that diamonds are easily burned, and that, although carbon is readily modified in character at the highest known temperatures, no form of it has ever been obtained at such temperatures except amorphous coke or charcoal, graphite, or, very recently, the hard powder known as "carbonundum," has seemed to indicate that the transparent, regular crystals of diamond could only have been deposited, like most other large, transparent crystals, from a solution, unruffled by the perturbations incident to a high temperature. M. Worth, however, says that diamond crystals never show any remains of the "footstalk" around which crystals deposited quietly from solutions like to arrange themselves; that there is no trace of increase of size by successive accretions around a small crystal; and that nearly all diamonds show scratches on the surface, or curvatures of the edges or faces, or interior cavities. These would hardly occur in crystals deposited from a solution, and indicate that, like crystals of iron, or ice, diamonds have been formed, not only at a high temperature, and under violent perturbations of the mass surrounding them, but that, before hardening, they were in a pasty condition, so that they received the impression of objects about them.

THE conditions under which carbon can exist in a transparent, pasty state must be very different from any known to modern chemical practice, but M. Worth makes some curious suggestions as to what those conditions may be. It seems to be evident, for one thing, that the diamond has been formed under very great pressure. In examining the crystals by polarized light, brilliant bands of interference colors have been observed, which seem to be due to the formation of layers of varying density around the enclosed cavities in the stone. These layers might be produced by the long-continued pressure of the liquid or gaseous contents of the cavities, supposing them to exist there in a state of intense compression. That this is, in at least some cases, still their condition is indicated by the fact that diamonds from the African mines frequently burst on being freed from their matrix. If diamonds contain gases under extreme compression, it is evidently important, in studying their formation, to know the nature of such gases. Naturally, the analysis of the tiny mass of gas contained in the minute cavities of a diamond is a matter of difficulty; but many circumstances indicate that it consists of hydrogen, perhaps combined with carbon. The African diamond mines show many traces of hydrocarbon, in the form of deposits of petroleum and accumulations of explosive gas. Moreover, the black diamond, which is merely an uncrystallized form, and is always associated with the transparent sort, gives out a quantity of small bubbles, when heated in water, and shows, by analysis, about one-half of one per cent of hydrogen. These circumstances lead, perhaps, to a suspicion that the diamond may have been formed from hydrocarbon gas, subjected at the same time to great pressure and intense heat. It is well known that diamonds exist in meteoric stones, and the curious pits, called by the miners "chimneys," which contain the diamond-bearing earth in the South African mines, have been conjectured to be the traces of the fall of a number of huge meteorites, which have buried themselves in the earth, leaving fragments of their substance behind them. M. Worth, however, considers it more probable that the "chimneys" were formed, or at least enlarged, by the eruption of matter from below. This would equally explain the development of an enormous pressure, accompanied with corresponding heat, and if we suppose masses of hydrocarbon gas, liquefied by pressure, to have been decomposed at the same time by heat, in such a way as to have deposited their carbon in the form of a soft paste, and this paste to have been then suddenly cooled, we shall have the conditions which seem likely to have resulted in the formation of the diamond.

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STYLE.[1]— V.



IN Greece, a different sentiment from that felt before the palace of Sargon, or at the sight of the temple of Khonsu, awaits us. Here, the mystery of the divinity is to be unveiled from afar to the eyes of the multitude; the temple is not shut-in all sides; on the contrary, it is surrounded with external porticos and the glory of the god that is worshipped within shines round about in sculptures set off by paintings, which prepare the mind of the visitor for the majesty of the divine image.

Our description of the Acropolis of Athens as well as of the neighboring ruins and the analysis of the sentiment that one experiences, alike before the ruins of this city and in the presence of analogous works in the different centres of Hellenic civilization — for instance, Olympia — will reveal the fact that a nation of freemen formerly inhabited this country, and the character of the monuments that were reared for its manifold needs will show that the social state was already very far advanced, and that the care that was exercised in the education of the youth was especially characteristic of it. The Greek town was not a collection of serfs in a vast enclosure under the eye of the master, it was a voluntary gathering of men around a venerated sanctuary. At Athens, this sanctuary, the Parthenon, dedicated to Wisdom, the protecting goddess of the city, overlooks the surrounding country and, thus favorably situated, may be seen from a distance in all its imposing beauty; when complete, uniting the three arts, architecture, sculpture and painting, it must have been magnificent. Other sanctuaries occupy the same platform, which was approached on the west by a winding path terminating at the Propylæa. The gods and goddesses of the Greeks were made in their own image and, however powerful they might be represented, there was always something human about them; they shared with man his virtues and his vices. It is the constant study of nature with man as the point of departure that has enabled men of all times to comprehend the productions of Greek art; it is possible that sensual enjoyments responded somewhat too much to their future aspirations; however this may be, they recognized in their gods a superiority that urged human beings to imitate them, so much so that the relations of the two, the tradition of which has been preserved for us in fable, evoked respect for the memory of ancestors judged worthy of such an honor in heroic times. The treasures of the city were under the protection of the divinity, and over them also watched the persons dedicated to the duties of worship, whose dwelling was near the sanctuary; different altars, statues and stations filled the enclosure of the platform. But a particularly noteworthy fact about the cities of Greece is the importance given to public edifices; the private houses were of very modest size, because the Greeks lived in them but little, while nowhere among contemporary nations do we encounter educational establishments as considerable as those of the Greeks: gymnasia, theatres and music-halls joined by porches, an example of which is offered us by the slopes of the hill dominated by the Parthenon. Why? Because the Greeks, who were the greatest educators of peoples in their day, passed their lives there. At the sight of these establishments, and on studying their purposes, one feels the *sentiment* of the physical and intellectural superiority of the men who erected them.

The *characteristic* of this superiority we find in the expression at once *robust* and *graceful*, simple and yet complete, in the truly natural perfection of the forms adopted by the artists in order to respond in a just fashion to the requirements of the new programmes that they were called upon to fulfil. In fact, it must be noted that the Greek constructors were the first to find the complete rational disposition, such as it appears in their monuments. This disposition required that the entablature be divided into three parts: architrave, frieze and cornice, indicating clearly the construction peculiar to each element. The Egyptians, even in the Ptolemaic epoch, composed their entablature of architraved cornices, the frieze being masked behind the cornice and blended with it, because the ceiling was so combined with the roofing as to form a single element. Later, the Romans copied the temples of the Greek colonies in Italy, the wise arrangement of which is wholly Hellenic; but, in their private architecture, architecture without columns, the Roman constructors admirably comprehended that the crowning of their edifices was naturally the cornice, surmounting or not an ornamented frieze with no architrave, the only true disposition. One of the most ancient of Doric temples was the temple of Hercules at Olympia; it apparently dates back to the eighth century B. C. The façade presents six columns and the lateral face sixteen; the shafts are adorned with sixteen channellings and the curve of the capitals differs for each one of them.

The gymnasia, theatres and music-halls occupied the most prominent place in the Greek city after the temple. Here literature, gymnastics and music were cultivated. Previous to his seventh year the child belonged to his mother, who prepared him for boyhood by recitals and games; from seven years on, he belonged to the Republic which made less account of his personal tastes than of the service that it intended one day to exact from the man. For that, the child was put into the hands of masters: the grammatist, the teacher of music and the trainer. The grammatist taught him to read, to write and to compute, and formed his intellect by moral education, while the teacher of music instructed him in singing and playing the flute and lyre, and the trainer developed his body by exercise in running, jumping, dancing, wrestling, throwing the discus and dart, boxing and the pancratium. Having passed the age of boyhood, at eighteen he was made a "man of age." He was trained to the handling of heavy arms, and in marching and horsemanship; finally, at the age of twenty, he was a citizen and carried on his education, when he had the leisure for it, in literature, philosophy, the sciences and drawing. Traces of this Greek education, which constituted the basis of society and prepared the nation for its high artistic attainments, are found in all the ancient cities; especially does it account for the respect that surrounded the sanctuary of Jupiter at Olympia and the popularity of the games celebrated there. The Greeks did not come together here merely to contend for the prizes awarded for muscular force, chariot-racing and horse-racing; tragedies, comedies, poetry, history, literature and music, all received here the honors of triumph.

Greek sculpture, which was somewhat too archaic, that is to say, artless, until the sixth century B. C., had acquired a wonderful degree of perfection in the time of Pericles; simple, broadly treated and of a finished naturalness, it is still the most perfect prototype of which an example has been preserved. Painting was greatly developed in Greek art; this is accounted for in architecture by the custom that prevailed of painting the early structures when built of wood, and then the later ones, in order to soften down the glowing whiteness of the marble, which was painful to the eyes in the bright sunlight and prevented one from judging of the delicacy of the forms.

Their familiarity with the nude had developed among the Greeks such a knowledge of the relationship of the organs to each other and of the functions that they fulfilled, that they naturally recognized and loved beauty and that they gave to their creations in the same line, the most correct proportions required by the laws of æsthetics. This same habit of observing nature, of searching into cause and effect, end and means, had likewise led artists to apply rational laws to their constructions, in which power lay rather in the judicious use of the material than in its mass. In that, Greek art differed much from the arts of the other nations of antiquity. Their earliest monuments were of wood, as may readily be inferred from the forms of the Doric Greek, in which the channellings of the shaft imitated the bark and blea around the trunk of a tree, and in which the butt-ends of tie-beams were represented by triglyphs, the metopes resulting from filling-in the spaces between the pieces of wood; and finally, the cornice, by its odd ornamentation, recalled the disposition of the main rafters and rafters resting on sleepers, with accompanying plates and pegs; the

[1] From the French of Léon Labrouste, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 961, page 85.

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whole was covered with painting. But the really artistic genius of the Greeks appears in the fact that when they began to build with marble they did not slavishly imitate the ornamentation of the wood; they simply drew inspiration from it for the creation of a new decoration, an interpretation which retained only such of the original forms as might contribute to the power of the expression. Thus the shaft of the columns continued to be channelled, the cluster formed by the channellings expressing at the same time greater strength and elegance of form, and the horizontal lines of the architrave appeared to bind the points of support together; then the lines of the triglyphs prolonged the columns and gave them added height by sharing with them the supporting functions; the metopes, independent, ornamented parts, indicated well their filling-in rôle and so on.

With methods as logical as those enumerated in this synthesis, in which the decoration was furnished by the construction, how could the constructors have failed to secure to their monuments the general qualities necessary to style? Evidently, as an examination will easily prove, they possess to a high degree *purity* of origin, *propriety* corresponding to the aspirations of Hellenic sentiment, *precision* of the means of execution in fulfilling the requirements of the programme, the *clearness* of expression peculiar to the edifice, the *naturalness* deduced from the logic of facts and perfect *appropriateness*. These are the qualities which so strongly commend the monuments of which we have just spoken to the attention of artists and which make them works of STYLE. Judging from their special characteristics and the statements of historians, those of Athens date back to the fifth century B. C.

In order to analyze the Roman style, our task should be enlarged to take in the full development of an advanced civilization, the characteristic of which would represent the resultant of the manifold needs of this civilization; but space fails us for this and we must confine ourselves to the most general indications.

Artists coming in contact with the different neighboring peoples borrowed from the Etruscans and Greeks processes that had been derived in part from the East, upon which they stamped the character peculiar to the Roman genius. This character forced them to aim at massiveness much more than at delicacy of details.

A conquering nation like the Assyrians, the Romans sought a style of architecture that could be introduced into every climate and that would admit of the use of all sorts of building material by any workman whatsoever. It is especially in this sort of architecture, that is to say, utilitarian architecture, that their artists exhibited the wonderfully fruitful resources of their knowledge; no other nation can vie with Rome in the building of roads, aqueducts and sewers; no other people has constructed a like number of public edifices in different countries for the purpose of asserting its possession and, at the same time, enabling the vanquished to participate in the activity of the conquerors; but, aside from the conduct of public matters, Italy, after prolonged barbarian invasions, had preserved few memories of the home-life of its inhabitants when, fortunately, the discovery of Pompeii, which had been buried for several centuries, delivered up to us the secrets of Roman customs as they existed when the nation was full of vital force. We turn, therefore, to Pompeii to ascertain the *general qualities* of the Roman style.

We will study the basilica as it has come down to us, not because, compared with the circus and the baths, it is the most important of monuments, but merely because it gives a good idea of Roman life. It covers a broad area; it was a vast market, where business was transacted with the entire world. The outer enclosure of the edifice is a wall 0.66m. in thickness, of coarse rubble-work and mortar, with engaged columns to receive the bearing of the roof timbers. The façade is closed by six pilasters with door-casings, the rebates of which mark the position of the boundaries; we enter then a sort of prostyle about 5 metres in depth by 20 metres in width, from which we have access, by ascending four steps, to a portico about 5 metres broad, forming an inner enclosure. The space between the two porticos is nearly 12 metres wide and more than 45 metres long; an altar 0.80m. by 1.76m. stands at the extremity opposite the entrance, in front of the rear portico, and faces a sort of tribune, raised on a platform and adorned with small channelled columns. Below the tribune are vaults reached by two small staircases, one on the right, the other on the left, opening on either side into what once served as a guard-house; the proceeds of fines were deposited in these vaults. In case disputes arose regarding their business relations, the Romans then had judges to whom they could appeal. The brick columns, 1.06m. in diameter, are channelled and of very curious disposition; there is an entrance on either side, in the axis of the lateral façades. As to the construction, it offers an example of the most common building processes adopted by the Romans; the materials differing in character, the whole was covered with stucco and painted, which, in the circumstances, was the most rational arrangement possible. The basilica of Pompeii was at the same time an exchange, a market, a bourse and a law-court. When we view its ruins and consider its size for a small town like Pompeii, we see how great the commercial importance of Roman cities must have been. In fact, behind the army of conquerors followed an army of merchants, and, if the barbarians received the benefits of an incomparable administration, in return, they handed over all their wealth to the victors.

The Romans characterized their predominant defect in their buildings, by frequently clothing ordinary materials with imitations of precious materials; this grew out of a very deplorable taste for false luxury; but, aside from this caprice, we cannot but marvel at the skill displayed by the Roman constructors — when they were not foreigners — for they succeeded in stamping their works with an appearance of strength in harmony with their wide supremacy and their crushing power; above all, as we have remarked, because this supremacy was based on *force* tempered by *reason*.

The basilica of Pompeii exhibits *purity* in the elements employed; as soon as the constructive system had been adopted that should respond to the peculiarity or *propriety* of the national character, which was colonizing and administrative, in the ruling class, and it was with extreme *precision* that the programme proposed was carried out. We read *clearly*, in the plan and the elevations, the will that served as the point of departure for the construction, corresponding so accurately and in such a *natural* manner to the needs of an entire people, and with none of the parts wanting in *appropriateness* in the exactions of any of the services of a business establishment.

The disposition and proportion of the architecture, both as regards *ensemble* and decorative details, combined to satisfy the laws of construction; the solid and open portions, the profiles and the painting, all are arranged to contribute to the production of an imposing and pleasing effect, a living and rational effect, and prepare the visitor for the sentiment whose characteristic is so perfectly indicated by the utilitarian side of the monument under consideration. The expression is impressive and powerful, proclaiming that the builders were the rulers of the world; especially do we feel this when we take in at a glance the basilica and the numerous adjacent structures that responded to the *ensemble* of Roman needs.

History tells us that this basilica was reared in the first century B. C.

Our last example is chosen in France, where a large number of works of style are to be found; the characteristics of these differ much, because they are the results of dominant social needs of wide dissimilarity. Let us make a synthetical examination of the Cathedral of Notre-Dame at Paris.

Entering the edifice after having made a tour of it, we are struck with the harmony that prevails, despite the important modifications that it underwent in 1245. The present site of the monument was occupied, in the fourth century, by the church of Saint Marcellus. At the close of the sixth century, there were two structures on a part of the land destined for the future cathedral; these were, on the south, Saint-Étienne, and, on the north, Sainte-Marie.

The Council of Paris, held in 829, met in the nave of Saint-Étienne. In 857, the Normans burned Sainte-Marie, which was restored about the middle of the twelfth century, and Abbé Suger gave a large stained-glass window for its decoration. The only remains of this edifice are the bas-reliefs of the tympanum and a part of the coving of the portal of Ste. Anne, which were re-introduced into one of the doors of the cathedral in the thirteenth century. As to Saint-Étienne, the nave of which was nearly 9 metres broad, it was removed in 1218, in order to give ample space for the new Cathedral of Notre-Dame.

The plan is in the form of a Latin cross; there are two towers in front and a spire at the intersection of the arms of the cross. The apse is on the east, while the entrances, three in number, are on the west, in the main façade; the central

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one of these is called the Portal of the Last Judgment; the one on the left, or northern side, is known as the Portal of the Virgin; while the southern one, toward the river, is dedicated to Ste. Anne; besides these, there are the Porte du Cloître and the Porte Saint-Marcel; and lastly, the Porte Rouge communicating with the chapter-house. In 1771, the architect Soufflot completely defaced the Portal of the Last Judgment, with an utter disregard for art which his ignorance as a constructor employed on the Panthéon at Paris could not adequately account for, and to which this latter monument would surely have fallen a prey had it not been for the knowledge of the skilful Professor Rondelet. There are five aisles, thirty-seven chapels, added after the fire of 1240, one hundred thirteen windows, almost all of which have been altered to admit light into the nave and choir, and lastly seventy-five pillars to support the vaults.

The main façade has four stories and is divided into three sections, marked off by four huge buttresses; the towers rise at the angles; the portals are in the Pointed style and are divided into two parts by a stone pillar, supporting a lintel, above which is a tympanum screened beneath numerous covings. At no period has a flight of steps formed a basement to the façade; the foundations have always rested on heavy unhewn stones and not on piles, as has often been asserted. A gallery, called the *Galerie des rois*, runs along over the ground-story; it is a series of niches containing modern statues of several French kings. It is crowned by a terrace with an open balustrade. The latter is composed of small colonnettes surmounted by pointed and semicircular arches, the archivolts of which are decorated with diamond-points. The centre of the next story is occupied by a large rose-window, lighting the principal nave. At the sides are double pointed windows, beneath a single pointed arch, with a false rose-window in the tympanum and trefoils at the angles. The towers begin at this elevation, but they are connected by an open gallery, constituting the upper story. It is made up of pointed arches in pairs borne on clustered colonnettes, with an open trefoil in each tympanum. Above the gallery runs a balustrade, completed by figures of monsters and animals. The towers are square, with buttresses at the angles adorned with crockets and terminating in gargoyles and turrets. They are pierced by two large pointed bays, decorated with colonnettes and crockets and having their archivolts composed of numerous tori; finally, a cornice comprising two rows of leafy crockets, with gargoyles, supports a balustrade similar to that crowning the gallery below and encloses a terrace which caps the structure. Many wonderful bells were suspended in these towers. The great *bourdon*, which hangs in the southern tower, weighs 13,000 kilogrammes and dates from 1400. It was never intended that the towers should be finished with spires. The gable of the principal nave is surmounted by an image of an angel sounding a trumpet; it is one of the few sculptures belonging to the period of the façade that have not been mutilated.

The lateral façades, on the north and south, are very similar. They are full of interest to us, for, though the main façade has not been subjected to any serious modifications in the general plan, they, on the contrary, were greatly altered before the cathedral was hardly completed. In fact, although the light was at first distributed in a way to answer the original requirements, there was, nevertheless, a large zone, halfway to the vaulting, which was deprived of direct light and produced the heavy effect of solid parts resting on open; therefore, after the conflagration which destroyed the timber-work and the upper portion of the structure, an effort was made to remedy this defect and at the same time embellish the cathedral by enlarging the windows, so as to put in stained-glass, in the execution of which rapid progress was then being made. The original construction can easily be detected from certain traces that are left. It will be noticed, above, that the window-sills were on a level with the bases of the outer colonnettes; these windows admitted light to the vaults; a bay of the tribune may also be seen with its vaulting fan-shaped on the exterior, a disposition as original as it was remarkable, contrived to allow the light to be thrown into the principal nave and the tribunes; clearly, the openings from the side-aisles into the chapels once served as windows, through which the former were amply lighted, previous to the addition of the chapels between the buttresses. But, at the same time, it is evident that there must have been, as has been remarked, a large unlighted space midway to the vaulting; though embellished with rose-windows that are now destroyed, these opened into the roofs of the side-aisles. It was to do away with this difficulty that the high windows were enlarged; the crowning of the tribunes was dropped and the fan-shaped vaulting modified, in order that this might be accomplished; the small interior rose-windows in each bay were removed and the tribune windows were lowered a great deal and enlarged. The fire of 1240 had also damaged the crowning of the nave as well as the pillars supporting the flying-buttresses, then constructed with two arches; these were rebuilt with a single arch and the pillars were cut down to the level of the open gallery above the story of the tribunes. Then, in 1245, chapels were erected between the buttresses of the sides; and the transepts, forming thus façades of the chapels, were extended in 1257; finally, in 1296, chapels were reared between the buttresses around the circular apse. It was not until the beginning of the fourteenth century that the choir enclosures and the painted-glass parts were finished. The Cathedral of Paris was then completed.

It produces the impression of a mysterious attraction; this is due to a softened light managed in the best possible manner; a profound sense of isolation rises within us, before the immensity and severity of the structure which envelops us; we feel ourselves lifted in spirit and borne as it were, toward a higher and happier world, to which we aspire as do the clusters of light columns supporting vaults of no less elevating influence; the calm that prepares one for meditation, the light gradually increasing until the high-altar is flooded with it, the wealth of coloring becoming more and more pronounced as we near the choir, everything tends to remove us from this world, separate us from earthly things and draws us nearer, not, in the Egyptian manner, to gloomy mystery, but to the glorious life of celestial beings; and the ogive arch, which constitutes the characteristic of this architecture, admirably images the *sentiment* experienced in its presence. After the terrors and miseries of the year 1000, came the revival of hope for Christian souls. This close correspondence between the sentiment and the systematic means that led to the expression adopted to respond so nobly to beauty shows us how deeply Mediæval artists concerned themselves with the laws of æsthetics.

[To be continued.]

A NOVEL HOT-WATER APPARATUS FOR RAIN OR DOUCHE BATHS.

IN my recent article on "The Modern Rain-bath"[1] I referred, in speaking of the hot-water arrangements for bathing purposes, to a novel and ingenious form of hot-water apparatus. This is called a "Gegenstrom Apparat," and it is now extensively used in Germany. It is invented and patented by Mr. Schaffstaedt, of Giessen, Germany.

The water is heated in this apparatus by means of high or low pressure, or by exhaust steam, and the apparatus derives its name from its special construction, it being so arranged that the cold water and steam travel in opposite directions (*gegenstrom*) without at all mixing together.

The Figures, 1 and 2, show a section and elevation of a small size of this heater. The cold water enters at *a* and travels upward in the direction of the arrow, while steam enters at *b* and travels downward, issuing in a condensed form at outlet *c*, which may be connected with the return steam-pipes. Pipe *d* carries the warm water to the douche *e*, which is placed inclined at a proper height above the bather. The water and steam cocks are designated by letters *f* and *g*, and a hot-water thermometer is placed at *h*.

The object of the apparatus is to heat water instantaneously to any desired temperature by means of steam, without the latter passing through the water. This it accomplishes thoroughly; the water is uniformly heated and the apparatus works without any noise whatever. It is so simple, and at the same time so efficient in construction, that the writer, with the approval of the medical superintendent of the Utica State Hospital, has adopted and ordered for its new bath-house now in course of construction, four heaters, each capable of supplying warm water for twelve douches, each discharging, on an average, about two and a half or three gallons per minute of warm water heated to 100° Fahrenheit. These will be the first "Gegenstrom" apparatus put in actual use in the United States.

In this apparatus, as is clearly seen in the illustration, the water and steam valves are so arranged that it is impossible to turn on the steam without first turning on the water. Moreover, the amount of heating-surface is so calculated and adjusted in all apparatus constructed specially for bath purposes, that for a certain constant pressure and temperature of steam, the temperature of the warm water will not exceed 110° Fahrenheit, when all the douches for which the apparatus is calculated are running simultaneously.

All similar appliances for warming water by direct admixture of steam are open to the objection that it is impossible, owing to changes in the water and steam pressure, to control exactly the

[1] Published in the *American Architect* of February 10, 1894.

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temperature of the warm water. Sometimes the steam is not completely condensed, and, as a result, the bather may be scalded by particles of steam escaping with the water. Moreover, all mixing-valves for steam and water cause more or less disagreeable noises, and often the water becomes impregnated with a peculiar odor, or else it is rendered somewhat impure by admixture of oil from the steam-pipes. The chief advantages claimed for the "Gegenstrom" apparatus are the following:

1. It accomplishes the instant warming of any quantity of water to any desired temperature; that is, by turning on both the cold water and the steam, the water which is admitted cold is discharged as warm water at the douche or at the nozzle; hence this apparatus effects a saving in time.

2. It also saves the first cost of a hot-water reservoir or boiler,

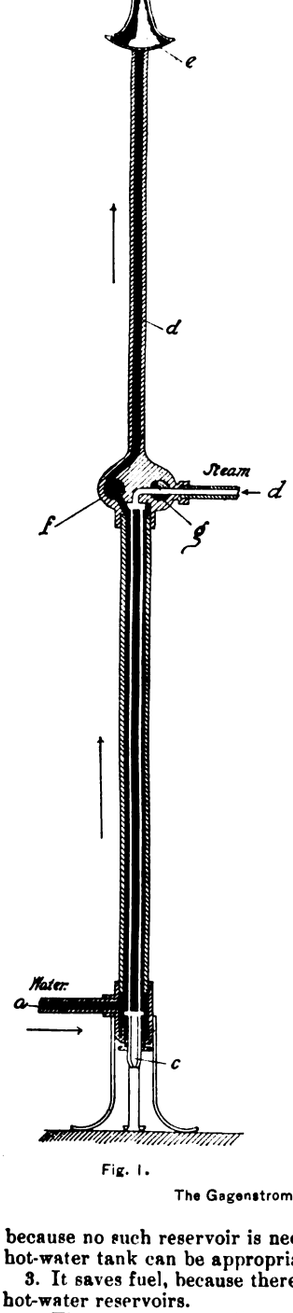


Fig. 1.

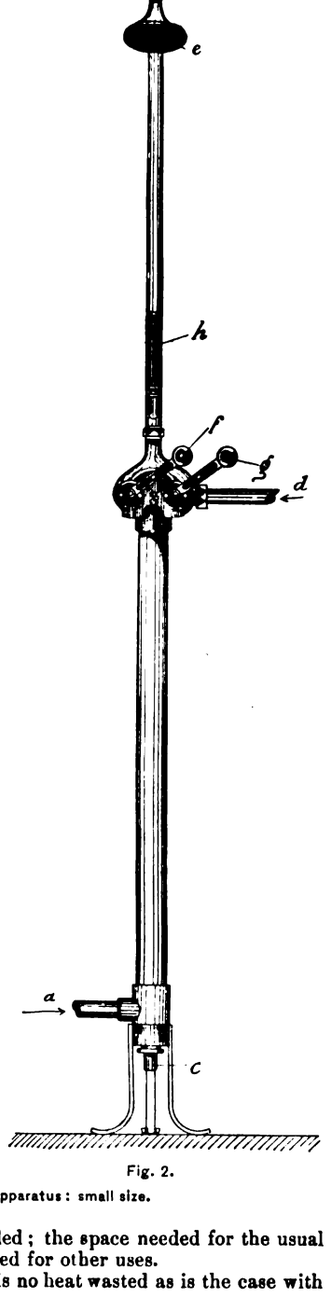


Fig. 2.

The Gegenstrom Apparatus: small size.

because no such reservoir is needed; the space needed for the usual hot-water tank can be appropriated for other uses.

3. It saves fuel, because there is no heat wasted as is the case with hot-water reservoirs.

4. The warm water generated by this method has no bad smell or bad taste, and is not in any way rendered impure.

5. The apparatus works perfectly noiselessly, because water and steam do not come in contact with each other.

6. The apparatus is perfectly safe and free from the danger of inflicting scaldings.

7. The apparatus is capable of perfect regulation, and gives instantly hot water of any desired temperature (limited to 110° Fahrenheit in those apparatus which are constructed specially for bathing purposes).

8. The apparatus is exceedingly economical in actual use, because it does away with hot-water tanks, and the corresponding amount of piping and a double set of valves or faucets. It requires only four connections, viz.: two steam, a supply and return connection, and two water, the cold-water inlet and the warm-water outlet, connections to the douche or the tub, as the case may be.

The Gegenstrom Apparatus is manufactured in various sizes and capacities. For smaller rain-bath establishments, and wherever it is comtemplated to allow each bather to regulate the water himself, the smallest size, as shown in Figures 1 and 2, is used and each apparatus supplies but one nozzle or douche.

In larger establishments, and wherever it is desired to bathe a number of people together and as quickly as possible, it is better to fit up the larger sizes of the apparatus, capable of supplying warm water to two, four, six, eight, ten, twelve, or twenty douches, and in this case the apparatus is controlled by some attendant and not by each bather individually.

The illustrations, Figures 3 and 4, show a front and a side elevation of one of the apparatus used in the Utica State Hospital rain-baths, designed to supply twelve douches. *A* is the cold-water-supply connection inlet, *B* the steam-supply and inlet, *C* the warm-water

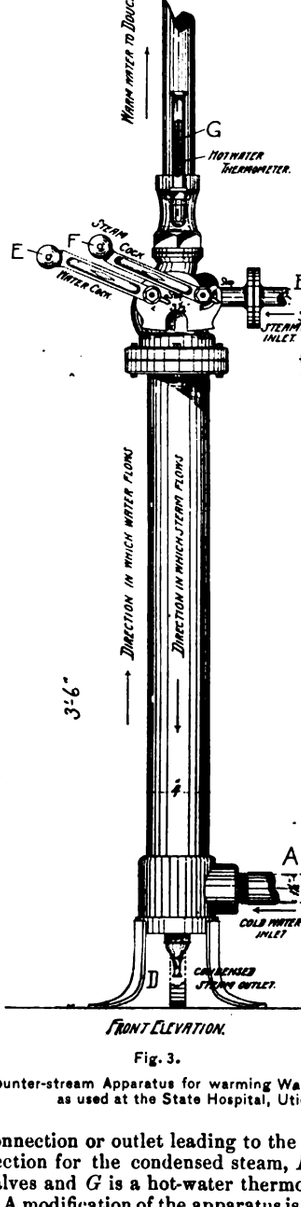


Fig. 3.

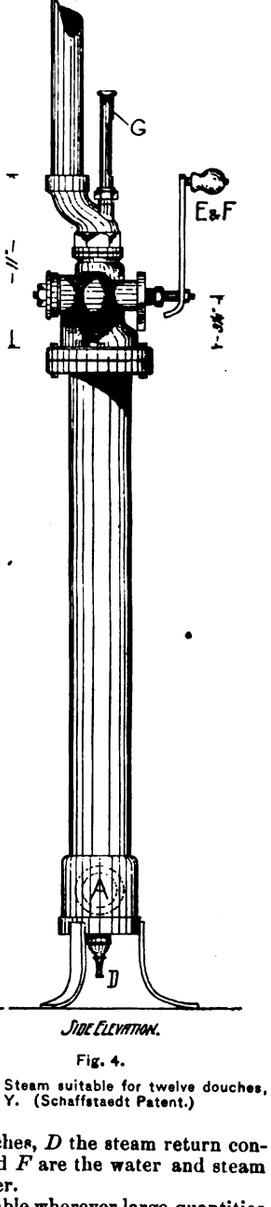


Fig. 4.

Counter-stream Apparatus for warming Water by Steam suitable for twelve douches, as used at the State Hospital, Utica, N. Y. (Schaffstaedt Patent.)

connection or outlet leading to the douches, *D* the steam return connection for the condensed steam, *E* and *F* are the water and steam valves and *G* is a hot-water thermometer.

A modification of the apparatus is suitable wherever large quantities of boiling or hot water are needed for washing or other purposes. A further modification of the same apparatus constitutes an economical and efficient feed-water heater for steam boilers.

After what I said in my previous article concerning the adaptation of douche or rain-baths, it is obvious that the "Gegenstrom" apparatus is suitable for a great many purposes. In fact, wherever steam is available it may be considered one of the most reliable, cheapest, and most economical apparatus for heating water of which I have knowledge. The Gegenstrom apparatus is, therefore, applicable to public or people's baths, whether the same be fitted up with bath-tubs or with rain-baths or with swimming-baths; it will also be particularly adapted in the case of hot mineral-baths, because with this apparatus the mineral water can be heated without losing any of its component

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parts. The apparatus will likewise be adapted for rain-baths in factories, manufacturing establishments, schools, hospitals and institutions. A modification of the same is applicable for heating water for washing and scrubbing purposes.

It can be used on board of ocean steamships or vessels of the Navy for rain or tub baths for the passengers, officers and sailors, and for boiling water for making coffee, or tea, or other hot drinks, or for washing purposes, particularly in the emigrants' quarters. In hospitals, prisons, asylums, and other public institutions, as well as in hotels, one form of the apparatus can be used for baths and another for heating water for kitchen and household service. In breweries and malt-houses it will be useful in connection with the cleaning of vats, kegs and barrels. In slaughter-houses or abattoirs, where large quantities of hot water are used for flushing and cleaning the floors of the buildings, in gas-works and numerous other industries the "Gegenstrom" apparatus may be used with advantage.

W. PAUL GERHARD.

THE ITALIAN RENAISSANCE.[1]—IV.

HINTS TO ARCHITECTURAL STUDENTS.

THERE are in the environs of Rome a number of points of great architectural interest, but they mainly belong to ancient times. Nevertheless they are, many of them, suggestive and profitable objects of study to the student of the Renaissance in the revelation they afford of the sources from which Renaissance architecture drew its inspiration and its models. We know that among the ruins within the city walls, the Basilica of Constantine and the Pantheon were the direct inspiration of such monuments as the dome of the Duomo, at Florence, and the dome and nave of St. Peter's, at Rome; that Alberti derived his idea of the façade of San Andrea at Mantua from the triumphal arches in and near the Forum and that the Colosseum undoubtedly suggested to the architects of Vignola's and Palladio's time the decorative use of engaged columns between the arches of a façade. It is well-known, moreover, that Raphael and his pupil, Giovanni da Udine, found in the frescos and stuccos of the substructures of the Baths of Titus the suggestions for the arabesques of the Vatican *loggie*, and from the same or similar models Giulio Romano learned the art of stucco-relief, which he so masterfully practised at Mantua and in the Villa Madama at Rome. Palladio's measured drawing of the Roman *thermae* and other antique monuments are classics to this day. Hence, the student of the Renaissance cannot afford to pass by the Forum, the temples, amphitheatres, arches, basilicas, baths and columns of old Rome, or the ruins on the Palatine hill; and the suburbs of Rome offer him further suggestive examples of Roman architectural art. These it is not practicable here to catalogue, but one may mention among others, as worthy of more than a passing glance, such ruins as the Baths of Caracalla, the so-called Temple of Minerva Medica, the Tor' dei Schiavi and, farther from the city, the extensive ruins of the magnificent Villa of Hadrian, and the marvellously picturesque ruins of Tivoli, the ancient Tibur.

Of Renaissance monuments there are few in the vicinity of Rome outside of the villas already mentioned (see the list in the *American Architect* for May 19, No. 960) just outside the walls. A pleasant excursion may be made to Frascati, a picturesque tower among the hills about fifteen miles southeast from Rome, where there is a Rococco cathedral (1700) dedicated to St. Peter and several villas of the sixteenth century. The principal of those are the Piccolomini, the Aldobrandini (by *Giacomo della Porta*), and the Tusculana or Villa Rufinella. The country is extremely beautiful in this region.

The route proposed for the travelling class leads from Rome via Orte, Narni and Terni to Spoleto: thence to Perugia, Cortona, Arezzo and Florence. At Orte those who desire it may diverge to Orvieto (26 miles). Here the chief attraction is, of course, the Cathedral (1290–1309), which is not a Renaissance work at all, but which no architect should fail to visit if he would understand the true spirit of Italian architectural design. For this spirit, in which the decorative and æsthetic feeling continually dominates the constructive and intellectual, is the same in Andrea Pisano's Gothic front to the Cathedral of Orvieto as in Alberti's façade to Santa Maria Novella in Florence, or Borgognone's façade of the Pavian Certosa, or a hundred other façades of the Renaissance. Moreover, the Cathedral contains the famous frescoes of Signorelli (begun indeed by Fra Angelico) and several beautiful Renaissance altars, all of which are worthy of study. Most of the palaces of Orvieto are Gothic (Vescovile, Soliano, del Comune); but the latter has a façade by *Scalza*, dated 1585; and there is also a palace by *Antonio da San Gallo*, the younger, called the Palazzo Marsciano. Here is also the famous well designed by the same architect in 1527, called the Pozzo di San Patrizio, 43 feet in diameter with two fine broad staircases leading spirally down, 200 feet, to the water.

At Terni those who wish may stop over a half-day to visit the exquisitely beautiful cascade delle Marmore, one of the loveliest spots in Italy; and the class will then rendezvous at Spoleto, for a stop of a day and a night.

SPOLETO.

This is an ancient city of nearly 80,000 inhabitants, and contains notable antique remains: among others, a Roman house, theatre and triumphal arch, with a magnificent Roman aqueduct (altered in the Middle Ages) across a ravine in the outskirts of the town. The Mediæval monuments are more numerous than those of the Renaissance, but the latter are not without interest.

1. CATHEDRAL SANTA MARIA ASSUNTA, portico: 1491, by *Ambrogio* and *Pippo d'Antonio*. The church dates from the eleventh century, but was restored in the twelfth century and the interior remodelled in 1644.
2. ORSINI MONUMENT, in cathedral: 1499, by *Ambrogio di Antonio*.
3. TOMB OF FRA FILIPPO LIPPI: sixteenth century.
4. CHURCH OF THE MANNA D'ORO: 1527 (?)
5. PALAZZO ARRONI: sixteenth century palace with sgraffito decorations.
6. SANTA MADONNA DI LORETO: 1572, façade of seventeenth century.

From Spoleto the route is through Foligno and Assisi to Perugia. Foligno will hardly detain the student careful of his time, although a few hours' stay might be accorded it for the sake of *Antonio da San Gallo's* chapel (1527) in the cathedral, (the latter, also, internally remodelled in the sixteenth and seventeenth centuries); the Palazzo Orfini and the Palazzo Deli (1510). But the wise tourist will willingly forego this visit for the sake of giving the time to Assisi, which some will very possibly prefer even to Spoleto as a stopping-place on the way to Perugia.

The Renaissance monuments of Assisi are not numerous, but no student of the Renaissance can well afford to miss the opportunity to visit and study the frescoes of Cimabue, Simone di Martino of Sienna and Giotto in the lower and upper church of St. Francis (San Francesco), together with the tombs and other examples of the art of the fourteenth century. In these works we discover the germs of true Renaissance art; as the work of Cimabue may be said to be the foundation of Italian Renaissance painting, so in the decorative accessories of Giotto's frescos, one discerns in sundry acanthus leaves and scrolls suggestions of the coming splendor of Renaissance ornament. The whole aggregation of fourteenth-century art in this noble church is intensely interesting, both for its own sake and for its revelation of that striving after the beautiful and for the freest expression of the artist's own individuality which were to characterize the Renaissance art of the fifteenth and sixteenth centuries in all its branches.

The only distinctively Renaissance buildings of Assisi are:

1. SANTA MARIA DEGLI ANGELI (near the station): 1569–73, by *Giacomo Barozzi di Vignola*, *Galiazzo Alessi* and *Giulio Danti* (nave and choir rebuilt in 1832 after damage by an earthquake; dome intact); ALTAR by *Andrea della Robbia* [?] in one of the chapels, (brought from some earlier church ?)
2. CHIESA NUOVA: 1615.
3. CATHEDRAL OF SAN RUFINO: interior modernized in 1572.

PERUGIA.

This ancient Etruscan town was at its zenith of prosperity at the very epoch of the first blossoming of Renaissance art. It contains interesting Mediæval monuments, the Fonte Maggiore, Palazzo Publico, San Pietro de' Casinensi and San Domenico, among others, the latter remodelled in the seventeenth century; one or two structures dating from early Christian times, and an ancient Etruscan gateway, the Porta Augusta. It holds an important place in the history of Italian painting of the Umbrian School, as the home, though not the birthplace of *Pietro (Vannucci) Perugino*, who at one time had Raphael for his pupil. Its chief interest to the student of Renaissance architecture lies in the tombs, monuments, choir-stalls and pulpits in its churches, belonging to the transition and early Renaissance and in two or three conspicuous buildings of the same period, rather than in any large number of Renaissance palaces or churches of importance. Worthy of study are:

1. IN SAN DOMENICO: the late Gothic monument to Pope Benedict XI: early fourteenth century, by *Giovanni Pisano*.
2. IN SAME CHURCH: the monument to Bishop Guidolotti, 1429.
3. IN CHOIR OF SAME: the splendid stained-glass window, 1441, by *Fra Bartolomeo;* recently "restored."
4. ORATORY OF SAN BERNARDINO: façade 1459–1461, by *Agostino di Duccio* (or *di Guccio*), with rich colored marble and terra-cotta.
5. IN SAN DOMENICO, choir stalls: 1459, attributed to *Agostino di Duccio*.
6. SALA DEL CAMBIO: about same date, by *Agostino di Duccio*, who also executed the interior fresco decorations.
7. CATHEDRAL OF SAN LORENZO: of uncertain date, an unfinished fifteenth-century building; contains the tomb of Bishop Baglioni by *Agostino di Duccio*.
8. PALAZZO DEL PODESTA: 1472.
9. PORTA DI SAN PIETRO: 1473, *Agostino di Duccio*.
10. IN SAN PIETRO DE' CASINENSI: altar by *Mino da Fiesole*, 1473.
11. IN SAN DOMENICO, choir-stalls: 1476.
12. OLD UNIVERSITY, now Court of Justice: 1483.
13. IN SAN LORENZO, choir-stalls: 1491, by *Giuliano da Majano* and *Domenico del Tasso*.
14. IN SAN PIETRO DE' CASINENSI, pulpits: 1515–1521, by *Francesco di Guido*.
15. IN SAN DOMENICO, tabernacle: 1519, by *Cesarino del Rescetto*.
16. IN SAN PIETRO DE' CASINENSI, choir-stalls: 1535, by *Stephano da Bergamo* from designs attributed to *Raphael*.
17. PALAZZO GALLENGA: 1560 (?) by *Galeazzo Alessi*.
18. IN SAN LORENZO, stained-glass window: by *Costantino di Rosato* and *Arrigo Fiammingo;* "restored" recently.
19. SAN DOMENICO: rebuilt early in seventeenth century, by *Carlo Maderno*.

The next important stopping-place of the class is Arezzo. Some of the members may, however, not find it amiss to make a short stop at Cortona on the way. Besides its Etruscan walls and Museum, the Mediæval churches of San Domenico and Santa Margherita, Cortona is interesting as the birthplace of Signorelli, a number of whose paintings are to be seen in the churches, and of Pietro da Cortona, an architect of the middle of the sixteenth century. The Cathedral is ascribed to *Antonio da San Gallo*, the younger: there are also a church dating from the end of the fifteenth century, the Madonna del Calcinago, by *Francesco di Giorgio*, and a sixteenth-century palace on the Via Guelfi.

[1] Continued from No. 960, page 74.

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AREZZO.

Here, as in Assisi and Spoleto, we find a preponderance of Mediæval work, especially of the fourteenth century, and many frescos by Renaissance artists, especially Spinello, Aretino and Lorenzetti. These it is not our province to enumerate, although the student will not fail to visit them for their intrinsic interest or beauty. The earliest architectural work by a Renaissance master was:

1. Completion: 1434, by *Bernardo di Lorenzo* of the Gothic façade of the Fraternita della Misericordia, on the Piazza Vasari.
2. Santa Maria delle Grazie (outside the walls) porch: latter part of fifteenth century, by *Benedetto da Majano;* altar in marble by *Andrea della Robbia.*
3. SS. Anunziata: 1520 (?) by *Antonio da San Gallo,* the elder; stained-glass window by *Guillaume de Marseille,* 1525.
4. Badia di S. Fiore: 1570 (?) by *Giorgio Vasari,* the artist and biographer, who was born in Arezzo and whose house is pointed out on the Borgo di San Vito.
5. Loggie on the Piazza Vasari: 1573, by *Giorgio Vasari.*

There is no place of special interest to arrest the attention of the student between Arezzo and Florence. A. D. F. Hamlin.

[To be continued.]



LONDON.

THE PROPOSED STREET AND BUILDINGS BILL. — LIGHT AND AIR. — THE FELLOWSHIP QUESTION. — REHOUSING THE POOR AT THE EAST END AND AT MILLBANK. — THE GOLD MEDAL.

OUR profession has been very busy in London during the past winter and I am afraid I have hardly kept you as well informed as I might have done as to the progress of events.

Perhaps our chief excitement has been a new Bill which is being promoted in Parliament by the London County Council for the control over the streets and buildings of the metropolis. The antiquated and ill-constructed Acts that now govern our building-work in London are very troublesome and unsatisfactory, and the County Council in its desire for reform seized upon the precedents of the Housing of the Working Classes Acts and the Public Health Acts. In both these instances a number of short Acts existed which were passed from time to time as occasion seemed to warrant, but which were not always consistent and were always difficult of access. The late Government, therefore, drew up and passed a Consolidating and Amending Act in which all the small Acts were concentrated and amendments made to bring the legislation up to date. In the case of the building-work, however, the precedent hardly applied, because the amendments introduced were of so far-reaching and drastic a character that interests were touched in all quarters and the opposition grew and multiplied. The chief struggle has taken place over the laws governing light and air. As I have explained in former letters, the only practical influence which prevents London from being covered with buildings so high as to entirely shut out light and air from its neighbors, are the laws of easement. Under these laws, a window which has for a period of twenty years enjoyed a certain amount of light cannot be deprived subsequently of its right without the consent of its owner. This power extends even to houses on the opposite sides of the street, and there are many instances in London where old houses have been demolished and, the owners of the opposite houses proving recalcitrant, the new buildings are shorn of their proposed upper stories. Generally, however, a money payment will remove these difficulties, and, consequently, property is becoming more and more confined. Then, among the districts inhabited by the poorer classes, the great increase of population and consequent demand for house-room has caused a set of building-speculators to spring up, who buy up the old two-storied houses and in their stead erect large blocks of tenement-buildings, often six or seven stories high and so close together that some of the lower floors are almost entirely dark. From these and other reasons the London County Council arrived at the conclusion that it must strengthen its hands and, as is usual with reformers, it went too far in the opposite direction. It proposed that all new buildings should be enclosed within a line drawn at an angle of forty-five degrees from the back of not only all property to be built on virgin soil, but on all rebuildings. A similar line is to be drawn from the opposite side of the street and the owner's rights in his land, so far as building is concerned, are practically to be confined within the limits of his portion of the triangle formed by the intersection of these two imaginary lines with the ground. It will be readily imagined that such an enactment would have the gravest results upon a large commercial city like London. As Mr. Cates said, in an able paper read before the Royal Institute of British Architects, "Any such legislation as is contemplated by this part of the Bill, would repress the desire for improvement, and compel the owners of houses which would be subject thereto to make every endeavor, by patching-up or repairs, to keep them out of the purview of the enactment." From what I hear, this portion of the Bill will either be wholly withdrawn or very greatly modified. There are a good many other important proposals contained in the Bill, but as its ultimate form is still a matter of uncertainty, no very useful object will be gained by rehearsing them. When the Bill is in its final form I will give you a *résumé.* Petitions have been presented against it from a large number of influential bodies and there is little chance of its passing in its present form.

A curious event has taken place with regard to the elections to the Fellowship of the Institute of Architects. In the olden days, architects desiring to become Fellows had, after being approved by the Institute Council, to be elected at the meeting by ballot. A desire, however, grew up that the Fellowship should only be conferred on men who had shown decided artistic ability and it was found that nominations were being increasingly rejected. The action of what was familiarly known as the "Art Clique" was defeated by a counter move of the Council who succeeded in carrying a proposal to substitute show of hands for voting by ballot, with an appeal to the whole body if necessary. At the last election a gentleman was nominated as Fellow who had previously failed to pass the obligatory examination for the Associateship and this created great indignation among those members who had passed. Consequently, a poll was demanded and, to every one's surprise, every architect nominated for the Fellowship who was not previously an Associate was rejected. Thus it seems that the Associates hold the opinion that entrance to the Fellowship should be entirely from the ranks of the Associates and, consequently, after examination. As the power is in their hands the position is a curious one, and will strengthen the hands of those who are aiming for a compulsory entrance-examination to the profession.

As the great rehousing scheme of the London County Council in the East End of London is well-advanced, a few particulars as to its progress will be of interest. The case was interesting, as it was the first that came under the new Housing of the Working Classes Act, 1890, which contained stringent provisions as to compensation. Under this Act if a house was overcrowded, the purchasing authority was authorized to calculate its value upon the rental which could have been obtained if the house had been let at reasonable rentals to its proper number of inmates. If it was in a bad condition, the cost of repair was to be deducted from its assessed value, and if it was altogether insanitary, it was to be reckoned as bricks and mortar only and valued at the net value of the materials. With an Act like this, it does not surprise one to learn that the claims of the property-owners, which amounted to £437,000, were settled amicably, or otherwise, for £266,000. The most difficult job was to remove the tenants, of whom there were nearly 1,300 in the area. Many of these people had lived in the district for years and the majority earned their living in the immediate neighborhood. The pressure for removal was, however, applied very leniently and gradually, and half those displaced found other suitable accommodation within a quarter of a mile of the area. Out of 948 who have removed, only 20 had to be summarily ejected and this says a good deal for the tact of the Council in dealing with them. While the valuer of the Council was acquiring the old property, their architect was preparing the plan for the new buildings. These will generally be on the "flat" system and some five stories in height. Some of the tenements will be self-contained while others — at a cheaper rent — will be arranged on the associated plan. The plan of the self-contained tenements is a very clever one. It is, I understand, proposed to erect a central laundry with the latest scientific appliances and in this building will be placed some huge boilers at which water will be heated and distributed with the help of calorifiers to all the sculleries over the entire area. The general plan of the scheme is a capital one and is based upon a number of streets radiating from a central circle, or open space, some 280 feet in diameter. This is connected with the main central street of Shoreditch by a central avenue.

The Council has in hand, as well as this, another great housing scheme at Millbank, in the West of London. This occupies about a half of the site of the old prison at Vauxhall, the front portion being occupied by Mr. Tate's Gallery of British Art and some military buildings. The general scheme here is also a good one. There is to be a wide central boulevard with four rows of trees running the long way of the site and the buildings will not be built fronting on the avenue, but at right angles to it, and so avoiding the monopoly which would have been almost inseparable from a great scheme of this nature had the other plan been adopted. Besides this, the Council have other rehousing schemes under way in other parts of the metropolis. It is not at first sight, perhaps, quite easy to understand why these schemes should be undertaken municipally and not left to private enterprise, but that is a large question which I must enter into another time.

Sir Frederic Leighton, President of the Royal Academy, has been offered and has accepted the Royal Gold Medal this year. He has always manifested a sort of architectural leaning and has lately been delivering a series of lectures on Spanish and other Renaissance architecture. His nomination is fairly popular, but from what one hears I think an architect's name would have created more enthusiasm.

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DEATH OF AUGUSTUS BAUER, ARCHITECT. — THE ARCHITECTURAL EXHIBITION AT THE ART INSTITUTE. — THE ARCHITECTURAL SKETCH-CLUB. — KEMEYS'S LIONS. — PARTRIDGE'S "SHAKESPEARE." — RECEPTION BY THE INSTITUTE OF BUILDING ARTS. — THE POST-OFFICE. — SALE OF THE FAIR BUILDINGS. — FAILURE OF THE STRIKE MOVEMENT.

DURING the month of February of this year there occurred in Chicago the death of one of our oldest practising architects, Augustus Bauer. He was at one time President of the Illinois Chapter of the American Institute of Architects and a man commanding respect from all who knew him. The Chapter has recently published a most excellent little memorial of him, which, in its quiet dignity and entire freedom from that post-mortem hyperbole so often found in such documents, is most suiting to the man it honors. The description of his character as given might almost serve as an ideal on which to form an honest, straightforward member of the profession, and as such an ideal it is quoted here: "As an architect, it can be said that as his works were largely of a utilitarian nature, he had few occasions for distinguishing himself by brilliancy or originality of design. Nor did he ever show any ambition in that direction. The several partners with whom he was associated at different times share this reputation with him. He was brought up in a conservative school, and always adhered to its tenets. He was thorough in everything, careful in matters of detail and a safe constructor, against whom no failure is recorded. While he never indulged in any extravagances of design, it can truly be said that nothing that is commonplace was ever produced by him. His experience was one of the largest that has ever fallen to the lot of an American architect, and it was well rewarded by the wealth that comes from industry and frugality, notwithstanding the great generosity of his nature as shown by his acts. It was a success that generally crowns the career of a strict practician, such as he was. For in the observance of the etiquette of the profession, to his clients and the contractors with whom he came in contact, he was a model for others to follow. When he said to a mechanic 'That is wrong,' there was no room for argument on either side. He never solicited patronage, and never entered a competition unless he was invited and paid for his services, and not always then. His friends were his clients, and his clients were his friends, and therein was one secret of his great success, from a business point-of-view. Here was a man who was in everything the opposite to the 'hustler' for business, who was always an architect, and never engaged in any other business (except as it became necessary for him to make good investments of the fruits of his labors), yet who was the most successful architect that Chicago has known. There was about him an element of honesty and straightforwardness which attracted clients, for he never misled them as to the probable cost of their investments. He estimated literally, knowing that he would always require good work that costs more than bad work, and no one was ever disappointed in the result."

The great interest of this month to architects is the exhibition now being held at the Art Institute under the auspices of the Architectural Sketch Club. The exhibition not only comprises architectural drawings, but much that pertains to the decoration of houses and buildings: architectural friezes in plaster, as well as the small models of sculptors, designs for color-decoration, stained-glass, architectural metal-work, tapestry, furniture, etc. The rugs, furniture and tapestry exhibit make a very attractive setting for the drawings, as well as adding much to the stained-glass and work of the sculptors. To meet all the requirements of an exhibition so varied in character, it was necessary to have the jury divided into various branches, or, in fact, a jury for each branch, which necessitated one in architecture and decoration, composed of architects, one for decorative subjects, composed of artists and architectural water-colorists and one on sculpture composed of sculptors. The Architectural Sketch Club is the second largest organization of its kind in the country. It has recently received encouragement from the Illinois Chapter of the American Institute in the shape of a gold medal, to be awarded annually to an active member of the Club, who has not been a practising architect for more than two years. According to a little history of the organization, published in the front of the catalogue for the present exhibition, "this Club was organized in 1881 by a few architects' assistants and designers in the allied arts, the object being then, as it is now, the mutual improvement of its members, and the advancement of art and architecture, accomplished by friendly competitions and a series of lectures and essays, relating to all matters pertaining to architecture or the arts.

"At present, classes are being held at stated times in water-color, modelling and pen-and-ink, under able instructors, and are fully appreciated by the members, as is shown by the large and steady attendance. The Club counts among its members some of the most prominent architects, artists, sculptors and members of the allied arts both in Chicago and elsewhere. The problems for competition are all carefully selected by the executive committee and all awards are made by an adjudicating committee composed of three of Chicago's well-known architects. Entertainment for the members is provided by a committee appointed for the purpose, and many a pleasant evening has been spent in the rooms of the Club. Besides the regular club competitions, which are for members exclusively, the Clark Medal competition, held under the auspices of the Club, is open to all draughtsmen." Many of the most prominent architectural firms of the city contributed to the exhibition, entering the work under their own names or under that of some of their draughtsmen, who are members of the Club. The exhibition is by no means confined to members, but work is shown by any one who can bring in something good in his especial line.

In the stained-glass exhibit the Linden Glass Company have some very good things. Especially charming is a composition of F. L. Linden, numbered 250a, "A Beaded Glass Window," rich in color and excellent in design. Several large firms make some very artistic displays in furniture, giving the designers their full share of credit, while Marshall Field and Company have loaned to the exhibition a few pleasing examples of old furniture, and some most excellent reproductions of old. This is also the case with embroideries and tapestries from the same firm.

One of the most excellently-treated designs for decorative work is one exhibited by Winslow Brothers for some wrought-iron electroliers. It is to be regretted that the name of the designer is not affixed to this work, but simply that of the firm for whom it was made. The designs for schemes of color-decoration are, taken as a whole, much weaker than work in the other departments. They are treated, many of them, so sketchily as to be quite unintelligible and not by any means showing the close study that such work is supposed to require. Impressionism, however excellent in certain places, is not a thing to be absolutely desired in a design where accuracy of intent is supposed to be shown, and some watery red or green washes on a wall, on which hangs a suggestion of a picture, and over which are scattered, possibly, some vague fleurs-de-lis, is not satisfactory in the place of some well and carefully studied scheme of color-decoration. Entirely opposite to these in treatment are two water-colors by R. C. Spencer, Jr., entitled "Mantua Ceilings." They are absolutely miniaturelike in the care of detail, though clear and strong in coloring. Mr. Spencer will be remembered as having taken a few years ago the Rotch travelling-scholarship. Strength and freedom, combined with a detailed accuracy especially to be desired in architectural studies, are to be noticed in his work. In a large drawing of his for the design of the main staircase of the Art Building, exhibited by Shepley, Rutan & Coolidge, is this especially noticeable.

One of the most successful water-colors is the rendering of a church of De Witt Taylor Kennard's, by L. Buck. As a picture it is attractive and the necessary details have not materially suffered. Ernest Albert, whose works are very properly entered under the title of "artist," shows us some most attractive water-colors, masterly and strong in style. Especially attractive in treatment from an architectural point of view is his No. 7, "Brick and Stone Entrance."

This artistic treatment of architectural subjects, to the minds of many clients brings a much clearer idea than would the more technical school treatment of the same subject, and so becomes quite legitimate, it would seem. It would, however, seem to necessitate a certain artistic ability in draughtsmen aside from any architectural training which is not always easy to find. And, moreover, does the question occur that to attain such proficiency, some sacrifice must be made to the time required for actual study in design? Would it be wiser to leave such work to a separate set of men whose education should be that of architectural artists? Or, with the proper kind of training would such work be as simple, not for the exceptional few, but for all, as the ordinary school work? Of course, a class of such workers, of distinctly architectural artists, does exist and has existed for some time, but not as an acknowledged separate profession, as is that of the decorative designer. Men and women who entered it, not drifted into it would, undoubtedly, feel from the start that it had many limitations, but how few who study and have aspirations of becoming great artists are certain of reaching the goal, giving to the world really great pictures.

Many of the architects exhibit, here, drawings of buildings which have actually been built, which are almost a separate class from the work entered by younger men — much of it problems for competition, sketches, etc. This work has often to be judged by a different standard from that of the younger men, not for artistic rendering so much as solid architectural worth. These studies are many of them interesting, as one is able to compare them with the actual buildings. Taken as a whole, the exhibition is most interesting and far exceeds any previous display of the kind made in the city before. Very noticeable is the impulse received for better work here, not alone in the three great branches of art — painting, sculpture and architecture — but also in all the industrial and applied arts.

The unveiling of Mr. Edward Kemeys's lions, before mentioned in these letters, was made a feature of the opening night of the Club exhibition. Taken as works of art they are fine. One stands looking southward in an attitude of mild expectancy, while the other's gaze is directed to the north: here the attitude is one of aggressive defense, his head thrown back and his tail evidently in the act of lashing from side to side. A struggle is apparently imminent. In the place in which they are they seem dangerously approaching the too colossal, and it might be a question whether a more architectural

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treatment of the beasts might not have made them more in harmony with the building they guard. They are certainly fine, and there is about them no suggestion of the usual iron lion, which was at one time so popular a sign at the front doors of dry-goods stores, but are able creations of art, and so entirely different from the things that have been sprung here so often on an unsuspecting public at the moment of unveiling, that we are devoutly thankful and proud of them.

Another unveiling which has taken place since the writing of last month's letter has been that of the Shakespeare statue in Lincoln Park, the work of Mr. William Ordway Partridge and the gift of one of our old citizens, the late Mr. Samuel Johnson. The work became quite familiar to us last summer through the plaster model shown at the World's Fair, and the final casting in bronze does not excel in excellence whatever idea may have been already formed of the work. The divine spark of genius, which should have come from Mr. Partridge to have made the "Immortal Bard" the truly immortal in this place, seems, alas! to have been lacking. There is nothing startlingly poor about the work, and neither is there anything by which we are convinced afresh by this figure before us that Shakespeare was a great and wonderful man. The well-rounded head, with which we are all so familiar, is here not idealized, but rather accentuated, and we feel to look at him, to use the Bard's own words, that he might have been one of those "dumb, wise fools, who saying nothing are considered wise," never the man whose words could have thrilled a civilized and cultivated world. The whole figure, which is a sitting one, speaks of weakness, not of deep thought and revery. The unveiling was made an interesting occasion, by means of bright speeches, and Mr. Willard, the actor, being discovered among those present, the crowd demanded that a few words should be heard from him, and coming forward he recited Swinburn's lines to the man who was that day being honored.

During the past years interest has so increased in the Institute of Building Arts that it now appears to stand on a firm and substantial basis, and the child of the Illinois Chapter seems to have an assured existence. Within the last week a reception has been held at the headquarters, the principal occasion being the opening of new rooms, which it was found necessary to add to the old ones. The chief room is the library, where those books that are owned by the Chapter are kept, as well as numerous photographs received from various World's Fair sources. This room is naturally used as a sort of club-room by members of the Institute when such a room is needed by them. The building-material exhibit has been much enlarged and formed an interesting feature of this spring reception. It has been satisfactorily demonstrated to all concerned that the Institute of Building Arts is a useful institution and helpful to both architects and clients.

In several letters, the insecurity and inadequacy of our post-office to the present needs of the city have been dwelt upon. It at present looks as if an appropriation from Congress might be forthcoming for a new structure. As usual, when any new and large public building is talked of in Chicago, there have been those who have advocated placing it on the Lake Front Park — in this case, a most inappropriate place as regards centralness of position to either roads carrying in or taking out the mails, as well as to the crowded business districts. The Lake-fronters have subsided for a time, at least, and though a temporary structure may be erected on this site, the old ground is more probably to be the one used. The report is (though very little that is accurate is known) that Congress will make an appropriation of four millions of dollars for this especial building, and with such a sum before us the first thought which arises is "What glorious possibilities of success — or most wretched failure, are to be had in such a building." What a pity that government work in our country is not synonymous, as it is in many European ones, with skill, artistic ability and success in design, meaning the employment of the best men that are to be found. It is to be hoped that politics may be eliminated from the matter and the advantages sought by the American Institute of Architects may be attained in this case.

Last month it was, for about the sixth time, again reported that the World's Fair buildings had been sold, this time to a Boston firm, but the sale fell through because of some complication concerning the understanding of the amount of cash to be paid down at the time of the transaction. The buildings, it would seem, have been finally sold this month, and the work of demolition has again been reported begun. With the exception of the Art Palace and the United States Government structure, the Chicago Wrecking Company gives eighty thousand dollars for the twenty principal buildings. The same company paid three thousand three hundred dollars extra for the main Government Building, the Life-saving station, the Meteorological Building and some minor structures. Seventeen of the original twenty structures will be removed inside of sixty days. In an interview the President of the Company is reported as saying "We are not going to touch the Manufactures Building, Machinery Hall or the Agricultural Building until the last moment, and they will undoubtedly remain standing all summer. All of the structures are going to be wrecked for the material of which they are built. We expect to pull out thirty thousand loads of kindling wood, and for the thousands of car-loads of staff on them we have been offered ten dollars a car. This is to be used for filling-in low land. Several railroads are figuring on the structural iron, particularly that of the Manufactures Building, which is good for bridge work."

Mr. Frederick Law Olmsted has been making plans for the laying out of Jackson Park, by which it is to be hoped some of the beauty of last summer will be preserved. He proposes a canal system stretching the whole length of the Plaisance, though for the present a lawn extending through this length, bordered by four rows of trees on each side will be the only improvement undertaken. As has been mentioned before in these letters, the Ferris Wheel will go to New York and the work of taking it down has already begun. It was reported that after the cars were removed the big wheel would make a final turn, while several of the Ferris Wheel Company officials would make a hazardous trip around it, either holding on to the beams or being tied to them. It will take ten weeks to take the wheel to pieces. Fifty men will begin the work and several hundred will be employed before the last beam is laid low. The material will be loaded on Illinois Central cars at Woodlawn Ave. and Sixty-third Street. The car that was used for carrying the Krupp gun will be used for the seventy-ton axle. The material will be taken to New York in five trains of thirty cars each. There are three thousand tons of metal in the wheel itself, and five hundred thousand feet of timber will be needed for the false-work. Taking the wheel down will be more dangerous than putting it up. One hundred and fifty thousand dollars will be the cost of taking the wheel down and re-erecting it in New York, where it is to be placed at Thirty-seventh Street and Broadway. Old Vienna, it is said, will be reproduced around it. Here, the wheel had three thousand electric-lights upon it, but in New York it will have double that number.

With the bright warm days of our exceptionally beautiful spring there is a general feeling of regret that the Fair, which at this time last year was so rapidly blossoming into perfection and beauty, is now fading away from our sight forever.

It seems as if the mildness of our pleasant spring had also invaded the spirit of the strikers, which at one time seemed to bid fair to assume a belligerent temper. Instead of a strike of large proportions with a lock-out of still larger, such as was at one time predicted, both have seemed to dissolve in talk, till no one can exactly tell what has become of either. May-Day came and went with no labor demonstration and the plumbers' strike is the only one that seems to have had a definite settlement of which the public has any cognisance. In this settlement both bosses and men made concessions, the men on the matter of wages, the old rule of three dollars and seventy-five cents a day remaining in force, while some minor points were ceded by the bosses to the men. This strike lasted nearly a month, and coming just as it did, on the first of May, caused a good deal of inconvenience to owners as well as to contractors of unfinished buildings.

Work in architects' offices here is generally exceedingly quiet this spring, and what work there is, is of the smallest kind, the farthest removed from any of a speculative nature. More large office-buildings have been built than there is actually any demand for, and it looks as if it would be some time before some of these sky-scrapers would be erected.

The work on the Board of Trade Building is progressing, and the tower has already been levelled with the upper stories of the edifice.

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

THE MANUFACTURES BUILDING. MR. G. B. POST, ARCHITECT, NEW YORK, N. Y., AND THE NORTH END OF THE ELECTRICITY BUILDING. MESSRS. VAN BRUNT & HOWE, ARCHITECTS, KANSAS CITY, MO. WORLD'S COLUMBIAN EXHIBITION: CHICAGO, ILL.

[Gelatine Print issued with the International and Imperial Editions only.]

THE SHEPARD MEMORIAL CHURCH, SCARBOROUGH HEIGHTS, N. Y. MESSRS. HAYDEL & SHEPARD, ARCHITECTS, NEW YORK, N. Y.

THE church will be of granite rubble, of a pink tinge, with trimmings of Indiana limestone. The height of the tower from the steps to the top of the cross will be about 120 feet. The interior dimensions of the main auditorium are: Width, 42 feet, and length, 80 feet. The entire length of the structure, including a large Sunday-school annex in the rear, will be 168 feet. The roofs also will be covered with copper. Steps from the front door will lead down to a plaza seventy-five feet square, and thence broad steps will lead to the roadway. In the three large windows of the main structure, each nineteen feet high, will be stained-glass designs. Strictly Classical treatment will be used in the interior of the main building. The main auditorium will have a seating-capacity of 350 and the Sunday-school room of 150 persons. The floors will be of mosaic in the church and there will be pews of carved wood. The wood-panelled ceiling will be one of the features of the main room: it is to be made of California redwood enriched with twenty-eight panels, each six feet square, and with carved wooden rosettes in their centres. This design will enclose, as in a huge frame, a large panel, itself broken up and subdivided into a large number of smaller panels. In the centre of the ceiling will be a great cross, carved

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from redwood. The inner walls are to be of cement, tinted to harmonize with the ceiling. The choir dome, under which the pulpit is to be placed, at the east end of the church, will be panelled with rosettes, and a large skylight will admit light from above. The organ is to be in the main tower, while the key-board will be under the choir dome. The church will be called the Scarborough Presbyterian Church.

THE MCKAY MAUSOLEUM, PITTSFIELD, MASS. MISS MARY TILLINGHAST, ARCHITECT, NEW YORK, N. Y.

THIS Mausoleum was built for Mr. Gordon McKay, of Newport, R. I., in 1893 and 1894. The exterior is of white marble from the quarries of Lee, Mass. The style of the exterior is Byzantine. The interior is lined with rose Numidian marble up to the spring of the arch. The faces of the sarcophagi, of which there are six, are of the same marble, richly carved. Above this line the dome is of glass mosaic, after the manner of the old mosaics of St. Mark's, Venice. There is no painting on the glass, the flesh even of the figures being entirely made of small bits of colored-glass. The ground-work is of gold glass. There are six figures in the dome representing Charity, Justice, Patience, Fate, Force and Invention as illustrating the age in which we live, also having reference to the client who has made a large fortune out of his inventions. There are five stained-glass windows, three of them memorials to the different members of Mr. McKay's family who are buried there — each illustrative of their lives and deaths: father, mother and two young brothers — incidentally showing the different seasons of the year and the times of the day, morning, noon and sunset. The third window illustrates the power "of the voice which is stilled," in memory of the first wife of Mr. McKay. The door is of bronze, after one of the doors of St. Mark's, Venice. The drainage, ventilation, etc., are very carefully cared for. The building is hexagonal in form, 32 feet high and measures from angle to angle of exterior 12 feet. The floor is of stone mosaic.

ALTERNATIVE SKETCH FOR HOUSE OF DAVID PEPPER, ESQ., CHESTNUT HILL, PHILADELPHIA, PA. MR. WILSON EYRE, JR., ARCHITECT, PHILADELPHIA, PA.

THE house actually built was quite different from that here shown.

THE TOWER OF CENTRAL COLLEGE, FAYETTE, IND. MR. W. C. ROOT, ARCHITECT, KANSAS CITY, MO.

HOUSE FOR C. B. MOORE, ESQ., PHILADELPHIA, PA. MR. WILSON EYRE, JR., ARCHITECT, PHILADELPHIA, PA.

ST. LOUIS WOMAN'S BUILDING, ST. LOUIS, MO. MR. W. ALBERT SWASEY, ARCHITECT, ST. LOUIS, MO.

[Additional Illustrations in the International Edition.]

THE IDAHO STATE BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MESSRS. CUTLER & POETZ, ARCHITECTS, SPOKANE, WASH.

[Gelatine Print.]

THE INDIANA STATE BUILDING. MR. H. I. COBB, ARCHITECT, CHICAGO, ILL., AND THE BUILDING OF PUBLIC COMFORT, MR. C. B. ATWOOD, ARCHITECT, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL.

[Gelatine Print.]

WAREHOUSE, BIRMINGHAM, ENG. MESSRS. NEWTON & CHEATLE, ARCHITECTS.

WEST-COOMB, SUSSEX, ENG. MR. H. C. FRASI, ARCHITECT.

SOCIETIES

THE AMERICAN INSTITUTE OF ARCHITECTS AND THE LATE CÉSAR DALY.

PROVIDENCE, R. I., May 22, 1894.

DEAR MADAME: —

It was with feelings of profound regret that the architects of America received the tidings of the decease of your late husband, for, although but a few of us had ever had the honor of taking him by the hand, thousands were intimately acquainted with him through the medium of his pen, and in a greater degree through their familiarity with the productions of his pencil.

The American Institute of Architects, of which he had for many years been an Honorary Member, at the first meeting of its Executive Committee, after his death, unanimously adopted the enclosed minute as an expression, not only of the individual sentiments of the members present, but also, as an expression of the respect entertained for him by the whole society, whose representatives they are, and of the large body of architects throughout the United States to whom he was as one of our own countrymen, because of that comradeship which obtains by devotion to the profession of Architecture and the love of Art.

With expressions of sympathy for yourself and family in the great loss which you have experienced, I have the honor to be

Yours sincerely, ALFRED STONE,
Secretary of the American Institute of Architects.

TO MME. CÉSAR DALY, Paris, France.

At a meeting of the Executive Committee of the American Institute of Architects holden in New York, April 21, 1894, the first meeting since the announcement of the decease of César Daly, it was unanimously voted to enter the following minute on its records and to send a copy of the same to his widow:

In the death of M. César Daly the American Institute of Architects, of which M. Daly had been an Honorary Member for more than a quarter of a century, recognizes the great loss of the profession of architects, not only in his native country but in the United States of America, where his voluminous and valuable publications were widely read and highly valued.

M. Daly's eighty-two years of intense and active life were devoted to the advancement of that profession to which he brought consummate skill of draughtsmanship, a profound knowledge of history and principles of design, great executive ability as an editor and writer while actively engaged in the exacting demands of a large practice and as architect to the French Government.

The influence of his writings and publications produced a marked effect on the architecture of the latter half of the nineteenth century, while his unselfish and enthusiastic helpfulness were appreciated by the architects of the civilized world.

The American Institute of Architects joins with the vast throng to do honor to his memory and to testify to its appreciation of his manly worth.

Attest, ALFRED STONE,
Secretary American Institute of Architects.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

DALY'S THEATRE, LONDON.

PORTLAND, OREGON, May 19, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In an article on "Theatres" in the *American Architect* of April 14, I see that your correspondent begins with a description of Daly's Theatre in London. Most of the article is devoted to planning and arrangement, but toward the end there occurs the following paragraph: "The decoration of this house is not quite as happy as it might be, being carried out in unrelieved masses of lacquered gold and silver; the architects, however, it is understood, were not responsible for this. The decorative idea originally sketched out and approved by them was much lighter in treatment." I imagine that the sectional drawings accompanying the article are from the architects' original drawings, since they are entirely different from the theatre as it now stands. I do not think that any one would hesitate long in deciding between the two.

The commonplace, stereotyped design shown in the drawings cannot be compared with the completed work — and it was a conviction that the interior of the theatre must have been done by some other than the architects of the rather unsatisfactory exterior, which kept me from mentioning them in a letter published in the *American Architect* of January 13, last.

I am inclined to believe that there are few, if any, more cleverly-designed interiors in existence than this same Daly's Theatre — but whether it is that your correspondent is taken with the mania of over-doing and frittering away chances, which is the inherent weakness of most English architects of the present generation; or that the architects spoken of above have won him over to their way of thinking — he has certainly given a wrong idea of the interior and has left us with the impression that the exterior and other work of the architects are above the average.

Yours faithfully, WM. M. ELLICOTT.

EXHIBITIONS

BOSTON, MASS. — *Several hundred Specimens of Textile Designs of all countries, from the second century to the present time, from the collection given by Denman W. Ross; also the Shirasu collection of Japanese Art:* at the Museum of Fine Arts.

Exhibition of New Tiffany Glass ware: at the Galleries of Williams & Everett, 190 Boylston Street, May 21 to June 2.

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Cincinnati, O. — *Exhibition of the Cincinnati Art Club:* at the Art Museum, May 17 to June 30.

New York, N. Y. — *Twenty-sixth Annual Spring Exhibition:* at the Metropolitan Museum of Art, opened May 8.

Exhibition of the Competitive Designs for the Decoration of the Oyer and Terminer Court-room: at the Century Club.

Group Exhibition by American Painters — William M. Chase, J. Alden Weir, Childe Hassam and others: at the Galleries of the American Fine Arts Society, 215 West 57th Street.

NOTES AND CLIPPINGS

Big Bells. — Some facts and statistics concerning the big bells of the world afford interesting reading. In the size and number of its bells Russia must be accorded first place. Moscow alone had 1,706 large bells before the great conflagration. Of these, the foremost was the Bolshoi (Giant), cast in the sixteenth century, and recast in 1854, when broken by falling from its supports. Its weight was estimated at 288,000 pounds, and it took twenty-four men to ring it by pulling the clapper. It was broken again when it fell during a fire in 1706, and its fragments were used in 1730 in casting the Tsar Kolokol (King of Bells), still one of the sights of the old Muscovite capital. It is 19¼ feet high and 60¾ feet round, and its weight is estimated at 443,772 pounds, the value of its metal being placed at $335,000. Tradition had it that this bell fell from some kind of belfry and buried itself partly in the earth; but experts have established that it was cast in a cavern under the Kremlin, where it had to remain, as the engineering skill of the time was not equal to lifting and removing it. The Emperor Nicholas raised it upon a granite pedastal, where it now stands, being used as a chapel. Entrance is gained through the chasm in the side, made by timbers falling upon it during a fire in 1737. Clarke reports of its predecessor that "when it was sounded, a deep, hollow murmur vibrated all over Moscow like the fullest tones of a vast organ or the rolling of distant thunder." Curiously enough, all the recent English writers omit any mention of the bell placed in the Church of the Redeemer, in Moscow, just three years ago, to commemorate the emancipation of the Bulgarians. The contractor tried to swindle the donors out of about seven tons of metal; but, even after this knavish "shortage," it weighed 60,736 pounds. Novgorod, too, claims a bell weighing 69,450 pounds. According to the Jesuit Lecompt, Pekin used to boast seven bells of 120,000 pounds weight each, and the big bell in the suburbs, 14 feet 6 inches high and 13 feet in diameter, is called the largest suspended bell. Burmah is a very country of bells. When the British took Rangoon, in 1852, they tried to carry off the sacred Shway Dagohn bell, but Maha Ganda was too heavy for the raft on which it was placed, tipped it over, and sank. The Burmans rescued it, and still use it. It weighs 95,000 pounds, and is of such fine tone that a flick of the finger nail will set it vibrating. The Mengoon bell, which has slipped from its supports, touches the ground on one side, weighs 201,600 pounds and is really the largest bell in the world.

Among the big bells of Europe are the famous Suzanne of Erfurt, 10½ feet high and 8¼ feet in diameter, cast in 1497, which weighs about 30,000 pounds; one at Olmutz, cast in 1711, which weighs 40,100 pounds; another at Vienna, some 450 pounds less; and that in the Cathedral at Paris, 38,000 pounds. The biggest bell in England is "Great Paul," cast for St. Paul's, London, by Taylor, of Loughborough. About twenty tons of metal were poured into the three furnaces, and, after overplus and waste are deducted, it will weigh about 39,200 pounds. It is 8 feet 10 inches from the lip to the top of the cannons, and 9 feet 6¾ inches from edge to edge of lip. Big Ben of Westminster is 9½ feet high and 7 feet 10 inches in diameter, and weighs 30,324 pounds; Great Peter of York Minster, founded in 1845, weighs 27,000 pounds; Great Tom of Oxford weighs 17,500 pounds, and Great Tom of Lincoln 12,000 pounds. According to Vincent, the bell of St. Peter's, at Rome, weighs 18,000 pounds. The big bell in one tower of the parish church at Montreal — erroneously called the French Cathedral — weighs about 29,500 pounds, and there is a chime of ten bells in the other, weighing about 22,000 pounds. This is called the largest on the continent, being nearly thrice the size of the big fire-bells of American cities. The old City-hall alarm-bell in New York weighed about 23,000 pounds. It was broken in 1867 in process of removal, and recast in smaller fire bells. The biggest now in New York is said to be that over the prison in Jefferson Market. — *Illustrated Carpenter and Builder.*

The Possibilities of Bamboo-growing in Louisiana. — That the Japanese bamboo can be grown with profit in Louisiana seems to be shown by the result of some experiments that a planter of Marksville has made. He says, "Three years ago I bought ten plants from a San Francisco importer. They were not received in the best condition. Only one plant out of the ten lived and grew. The first year the shoots or canes came out about the size of a pencil; the second year (1892) the canes came out the size of a man's thumb, ten feet high. This, the third year, they came out as large as big cornstalks. The plant has grown twenty feet high and spread over fifty feet of ground. A furniture man from New Orleans was here this past summer, and says there is a fortune for any man who will grow the bamboo to supply the furniture manufactories, and he engaged all I could grow at a good price. I figured out what an acre would bring me. If I were to put it down, no one would hardly believe my story. Suffice it to say that there is nothing that grows from the ground that will pay better. Merchantable canes are grown in one season from a five or six year-old set plantation large enough to make bedsteads, chairs, picture frames, etc. The canes come out stouter each year until they get large enough to split in four and make a good fence, and as the canes are cut down from year to year, new shoots constantly come up, which grow with increased vigor and phenomenal rapidity. Gen. Kirkham has a record of eight inches per day attained in his California plantation. My plants have not yet made such rapid growth, but from indications of their past growth I expect to see next year even more rapid growth." — *N. Y. Evening Post.*

Origin of Spiral Wires on Electric Fixtures. — More than one observing person not familiar with electrical apparatus has had his curiosity aroused by noticing that in a great many pieces of apparatus when installed the wire immediately next to the appliance has been twisted in a neat coil not unlike that of a spring. This curious feature is seen in the wire leading to telephones, push-buttons, call-bells, and the like, while it may be also observed sometimes in the heavier wires, which are attached to the "hanger-boards" of arc lamps. As a matter of fact, these coils are not an essential element in any mechanism, though many believe them to be so; but are simply a symmetrical way of disposing of the slack wire that had been allowed in measuring the distance. So easily do we become fixed in our habits, that this transitional arrangement may now be noticed in a great many places where there is not the slightest necessity for it, and the most striking example is that furnished by a large electric-lighting plant in England, where the huge copper rods leading from the dynamos to the switch-board have actually been tortured into corkscrew resemblance to the involutions attached to the smaller and cruder devices of bygone years. This is another instance of English conservatism, which is still manifested, as Herbert Spencer has noted, in the retention of the lines of the old stage-coach in their most modern railway cars. — *Philadelphia Press.*

Ceiling Paintings declared to be Fixtures. — Judge McAdam in the Superior Court to-day, filed a decision continuing until trial, a preliminary injunction obtained by Isaac Cahn which restrained Mary L. Hewsey from removing "five certain ceilings consisting of hand-painted canvas firmly cemented and affixed to the building," from the premises, No 1045 Fifth Avenue. Last February the plaintiff conveyed the premises to the defendant for $80,000. The property was previously mortgaged for $40,000 and Cahn took from Mrs. Hewsey another mortgage for $20,000. The ceiling paintings were in the house at the time of the conveyance and enhanced its value. They were not mentioned in the inventory of the furnishings of the house which Mrs. Hewsey also purchased. Recently she has advertised the paintings for sale among her household effects. In the opinion filed by Judge McAdam he held that the failure to include the paintings in the inventory of furniture showed that both grantor and grantee regarded them as fixtures attached to the realty, and that they must therefore be regarded as fixtures as between mortgagor and mortgagee. He held also, as well established, that injunction will lie against a mortgagor in possession to stay waste. He quoted at length the decision of Lord Romilly in D'Eyntort *vs.* Gregory, which held that paintings affixed to the wall of a dwelling are fixtures. — *N. Y. Evening Post.*

Iron Railway Tunnel in Scotland. — The completion of one of the largest railway iron tunnels in Great Britain, at Glasgow — the Mound North tunnel on the North British line — is noted in *Transport.* The mound is a large artificial earthern embankment made across the bed of the old Nor' lock, and carrying the National Gallery and one of the main thoroughfares between the old and new towns, and the work has, therefore, had to be carried out with great care. At the beginning of the tunnelling operations a slight "movement" took place at the National Gallery, and cracking was observable here and there throughout the building, but nothing very serious occurred. The new tunnel is in effect a huge cast-iron tube, 17 feet six inches in diameter, composed of segments 4 feet long by eighteen inches in breadth, bolted together through flanges 7 inches deep and 1 7-8 inch thick. In cutting the tunnel the shield system was adopted; the average rate of progress per day being one foot nine inches. The appliances used in the construction of this work will now be removed to the south side of the existing tunnel, where a second single-line tunnel, in connection with the Waverly Station improvements, is also being pierced.

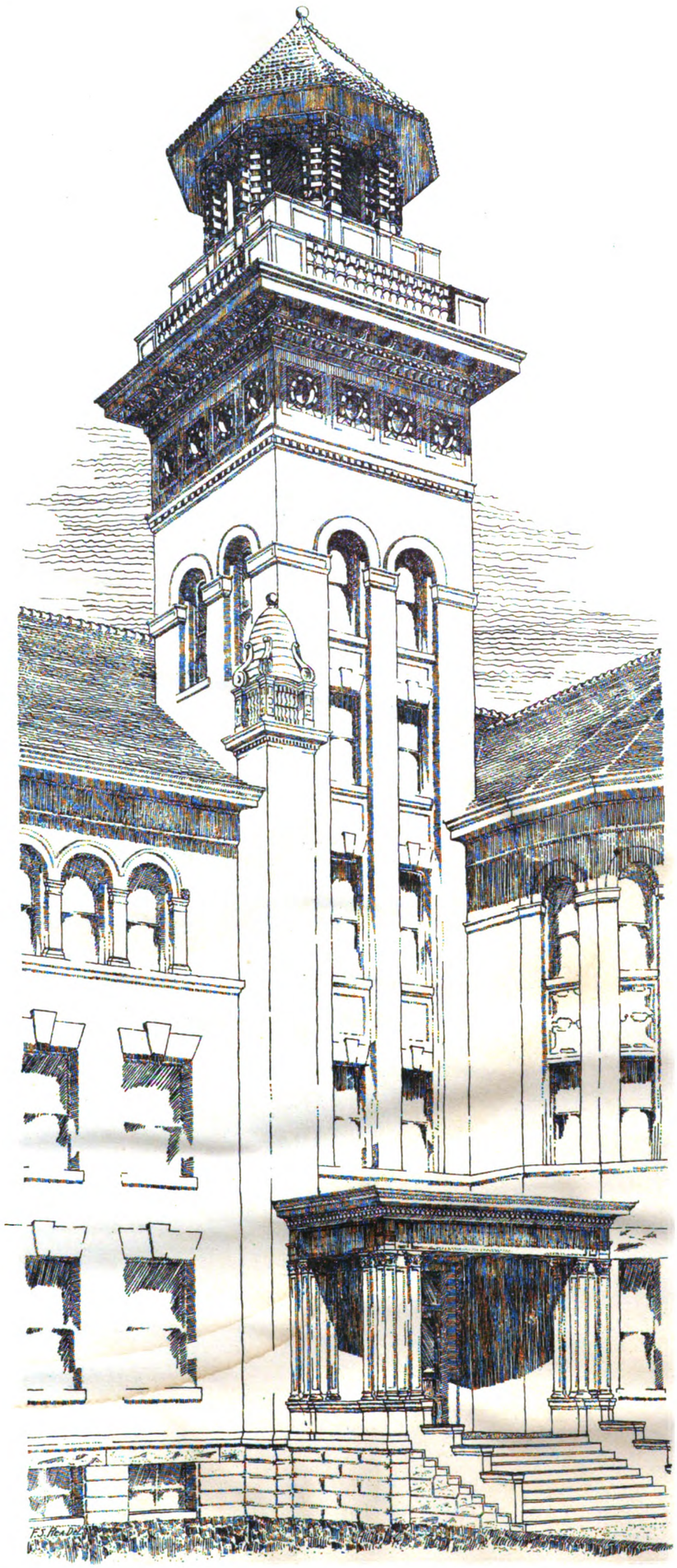
Curious Memorials in England of America's Triumphs. — John Fretwell says in the *Providence Journal*: During a late visit to my native land I was the guest of the owner of Parlington Hall, in Yorkshire. Driving through the park we passed under a triumphal arch which bore the inscription, "Liberty in North America triumphant, 1783," and on asking its origin, my host replied: — "My wife's grandfather, a member of the Whig party, erected the arch to commemorate the victory of George Washington over the troops of King George at Yorktown." Another time, when lecturing at Rotherham, in Yorkshire, I passed an inn called the Boston Castle, near the entrance to the park, and asking the reason for the strange name, was told that Lord Effingham, as the former proprietor of the estate, was so delighted when he heard of the throwing of the tea-chests into Boston harbor that he christened his hunting-lodge, now in the park, the "Boston Castle" and so arose the name of the inn. While English literature contains many memorials of the sympathy of the best class of Englishmen with the cause of the American Colonies, there are, I believe, no edifices of this kind outside of Yorkshire.

Buckingham Palace a School Site! — At a recent meeting of the London School Board the question of a site for a school near the Victoria Station was discussed. A site of 18,000 ft. was suggested, but General Sim insisted that it was not large enough. The Rev. Stewart Headlam then proposed that Buckingham Palace would make an excellent Board school. Seeing that it is never occupied, and that it is State property, it ought really to be turned to some useful account. — *Reynolds's Newspaper.*

S. J. Parkhill & Co., Printers, Boston, U. S. A.

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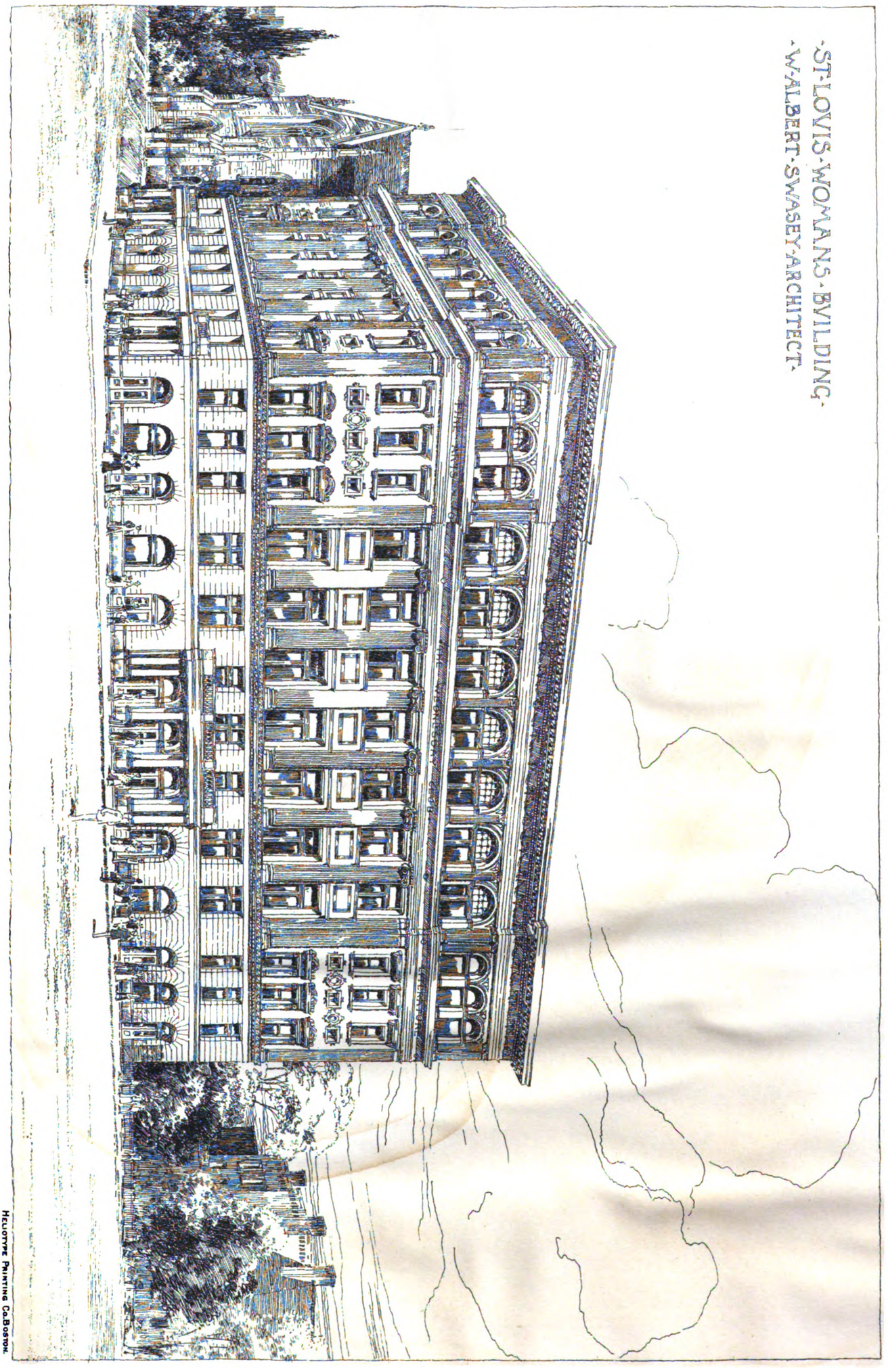
TOWER OF CENTRAL COLLEGE FAYETTE MO

W C ROOT ARCH'T KANSAS CITY MO

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ST. LOUIS WOMANS BUILDING.
W. ALBERT SWASEY ARCHITECT.

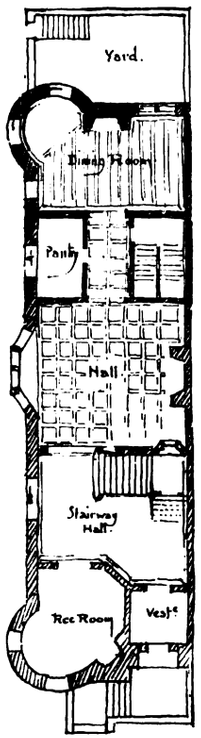
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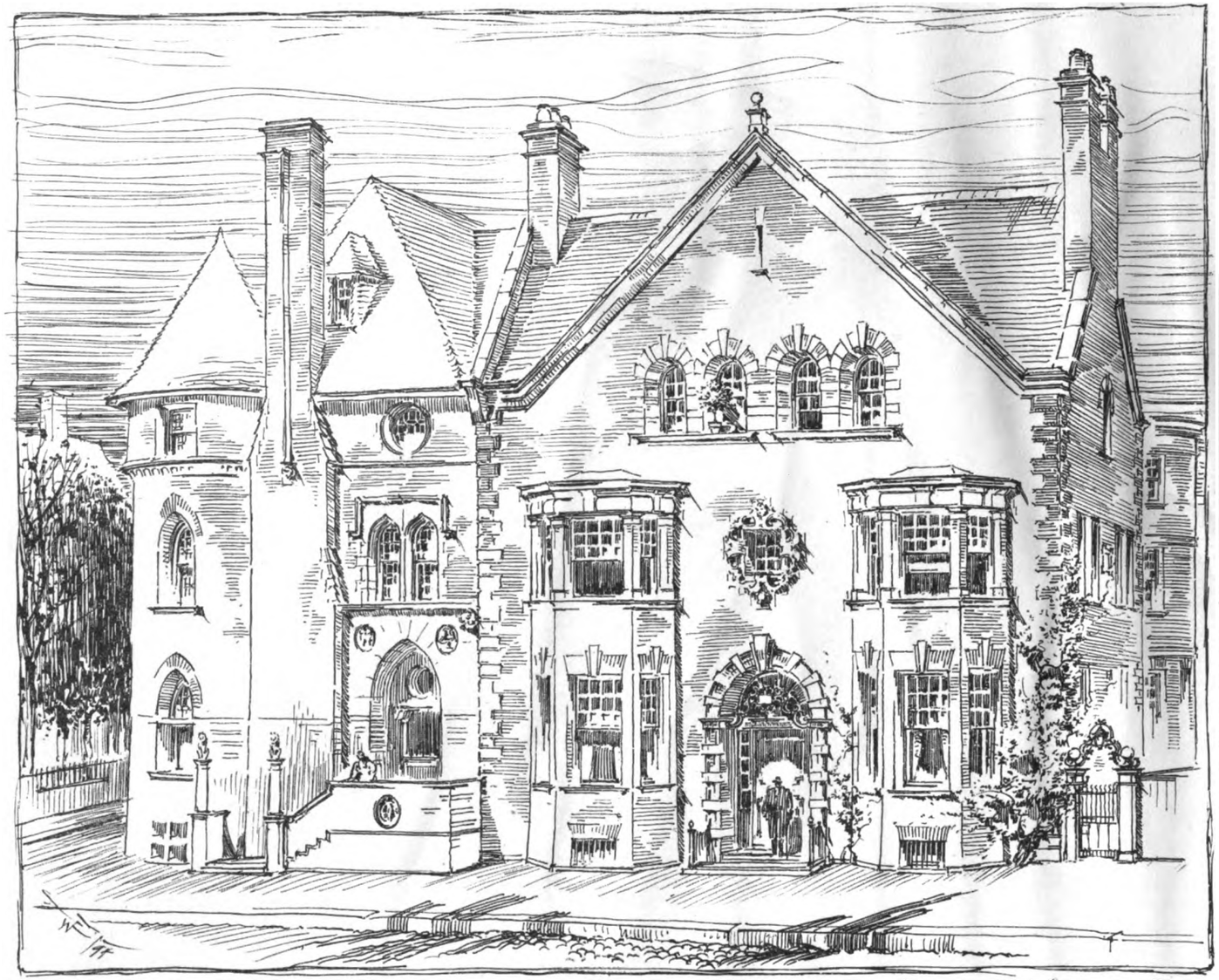
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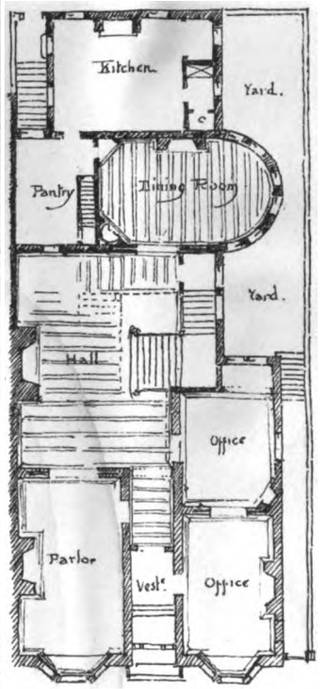
Sketch Plan.



House for Mr C.B.Moore 1321 Locust St

House for Dr Joseph Leidy 1319 Locust St.

Wilson Eyre Jr Architect, Phila.



Sketch Plan.

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PROPOSED
COUNTRY HOUSE
FOR DAVID DEPPER, ESQ.
CHESTNUT HILL PHILA.
WILSON EYRE JR.
ARCHITECT.

(Alternate Sketch.)

SKETCH PLAN

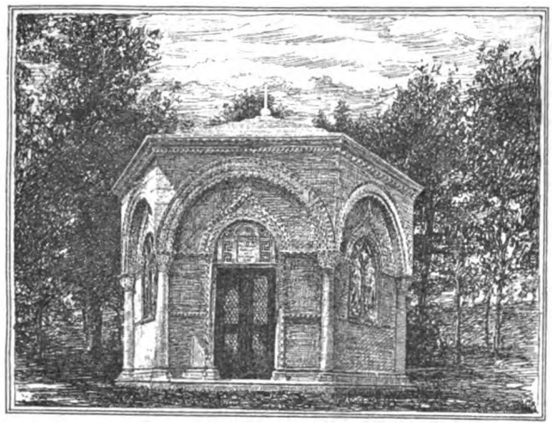
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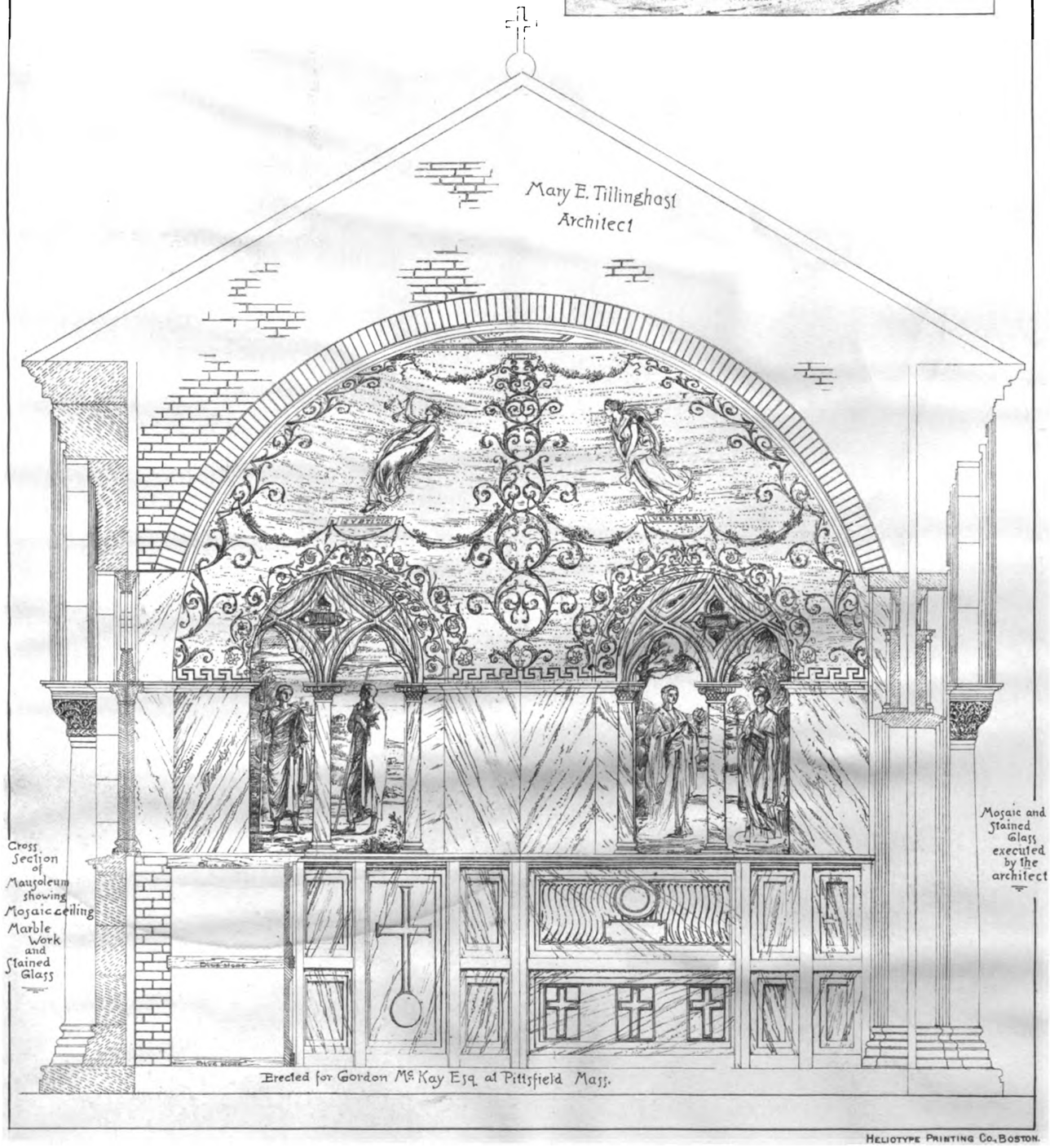
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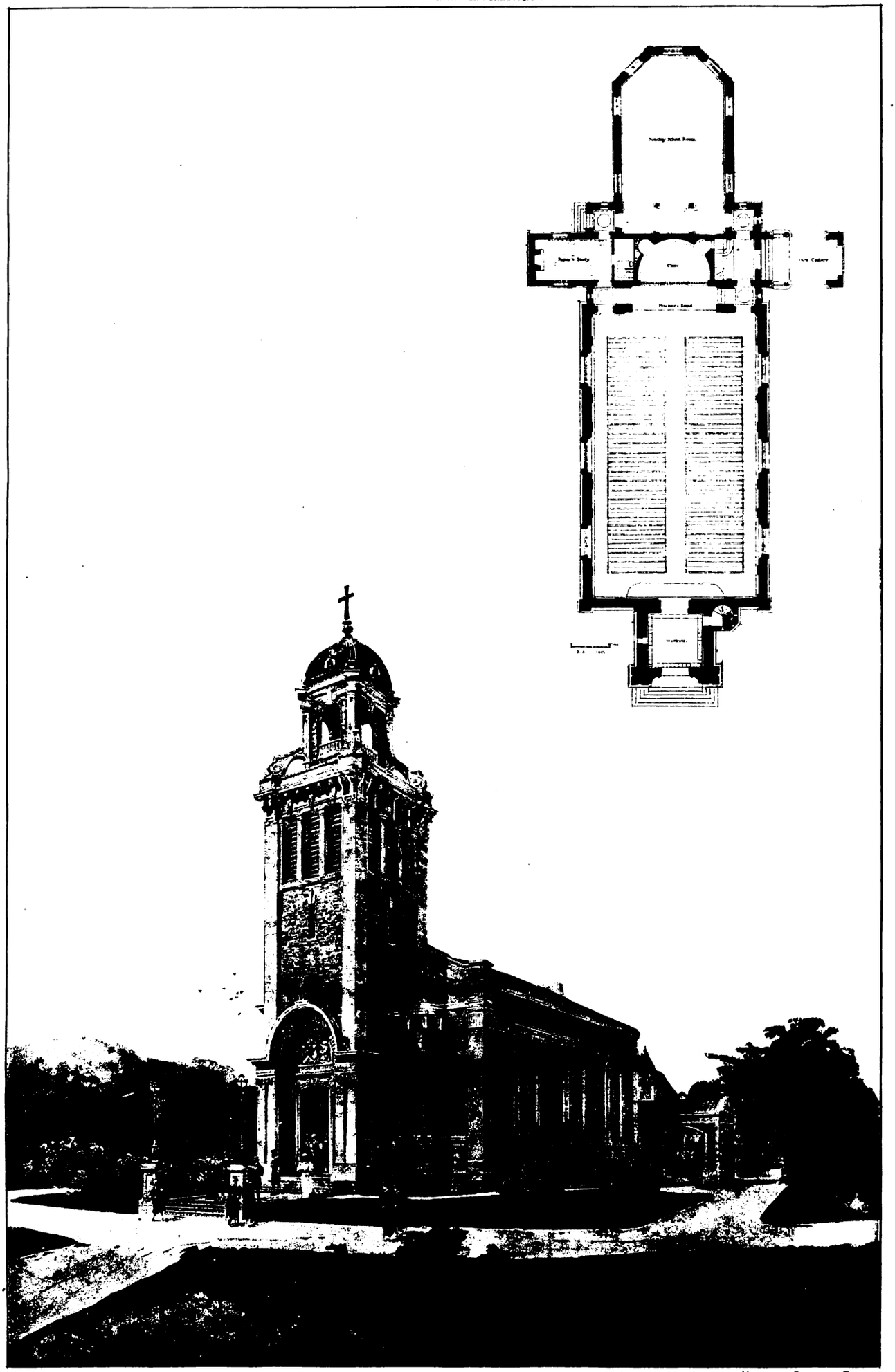


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THE SHEPARD MEMORIAL CHURCH, SCARBOROUGH HEIGHTS, N. Y.

HAYDEL & SHEPARD, Architects.

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THE AMERICAN ARCHITECT AND BUILDING NEWS.

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JUNE 9, 1894.

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ALREADY architects are murmuring at the overcrowding of the profession and wondering how they are to make a living in view of the number of young fellows who, each year, are graduated from the technical schools, each more or less determined to establish a practice of his own in the shortest practicable time. There might be, if our country were older, a very real danger that the architects might find less and less work for them to do, but the architectural school would be only one of three causes and perhaps less dangerous than the other two. These two dangers lie in the two facts, that it is the effort of every architect nowadays to build indestructible buildings — and a measureable success is being achieved in this, — and that buildings are begun, finished and delivered to their owners with unexampled and increasing rapidity. The result is that within a few years vast sums of money have been transmuted into practically imperishable building improvements and it will be long years before the surplus interest on such investments can accumulate another building fund. Fortunately, money is but a token of value received and what the same man may not again accumulate may fall into the hands of another, who may be willing to entrust its spending to the same or another architect. Still the increasing output, so to call it, of the architectural school is a thing to be considered attentively, for it seems not impossible to overcrowd what is in many ways a new profession. A new architectural school is, therefore, a factor of the professional future to be welcomed only if it can prove beneficial to others than the few who can derive a personal benefit from its curriculum.

HOW far Harvard University is justified in establishing an architectural department can only be proved by lapse of time, and it is open to doubt whether this department has been established because there was felt to be a need or because the authorities, in pursuing their policy of rounding out their field of operations and justifying the rather modern name of their institution, felt that it would be a good thing to incorporate such a department with their other branches of instruction. If the new departure was to be made at Harvard at all, we are disposed to regret that the department was made an adjunct of the Lawrence Scientific School and was not frankly added to the courses in the College proper, where in some ways it more legitimately belongs, or, rather, where there would be a better chance for its growth in the one needed direction, that of architecture as an art pure and simple. There are enough architectural departments now doing excellent work as attachments to scientific schools — we believe that every one of the older schools is attached to the scientific side and not to the side of arts and letters, so that graduates can only receive the degree S. B., and not A. B., which seems more befitting a practitioner of the arts. It is true that the difference between the freedom of action of the ordinary undergraduate and the regular hours and consecutive work of the architectural student over the drawing-board would be more marked if the department were connected with the College proper. But so much the better, so much the greater isolation, so much the better chance of expanding in the one direction in which it is really desirable that it should expand, if it is to become a really desirable factor in architectural education. The need of the hour is the cultivation of the senses, not of the head and fingers only. Sooner or later there will be established somewhere and by somebody a thoroughly equipped and self-contained academy of fine arts, and, if it is conceived on proper lines and broad-mindedly conducted, it will inevitably be a success and as inevitably work an injury to the prosperity of those architectural departments which are now adjuncts of scientific schools, by withdrawing from them those pupils who feel the inborn capacity to fit themselves for the higher reaches of the profession, but find the curriculum of the scientific schools somewhat cramping and restraining. If Harvard University finds itself unable to establish such an independent school of fine art, it seems to us that it would be wise in allowing its new department to be developed in that direction so that it may be better able to join hands with the coming greater institution.

IN placing the department under the charge of Mr. H. Langford Warren, and in allowing him to choose as his chief assistant Mr. George F. Newton, the University has shown excellent judgment, if it is the purpose to allow the department to develop on its architectural side; but these gentlemen can only make a success of their undertaking if they, from the outset, set their faces resolutely against allowing their department to become the haven of regular and special students whose intellectual effort, during their career, is mainly confined to the few hours' consideration at the beginning of the year, needed to determine which of the multifarious elective courses is likely to prove the "softest thing." The popular delusion that the practice of architecture is a nice, easy, clean and gentlemanly pursuit is likely to lead a great number of young fellows with more money than talent, brains or perseverance to elect the new course, and if a success is to be made, it can only be through subjecting these human grasshoppers to the bitter disappointment of finding that they have let themselves in for more serious and sterner effort than any other body of students connected with the University is subjected to. That there is no royal road to architecture should be made patent to authorities and students alike by the sharpest and most persistent use of the pruning-knife.

WE take pleasure in calling attention, as requested, to the establishment of a National School of Electricity, with headquarters at Chicago, under the direction of Professor J. P. Barrett, Chief Electrician for the City of Chicago, and late Chief of the Department of Electricity of the World's Columbian Exposition. The school is to be conducted partly by correspondence, and partly by classes. A certain number of students, living in or near a given town, will be formed into a class, to which an instructor will be assigned. The instructor will be provided with instruments and apparatus, and such diagrams as may be needed for class-work, and suitable blackboards for giving explanations on the spot. In order that the lessons may be uniform, a "lesson leaf" will be issued each week, containing detailed information, tables, etc., relating to a single subject, with review questions on the previous lesson. The school course consists of forty weekly lessons. It is not intended, as the prospectus very frankly informs us, to take the place of such a course in electrical engineering as

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is afforded by the great technical schools, but there is no doubt that hundreds, perhaps thousands, of boys and girls just out of the high schools, and of young and ambitious men, with a taste for such knowledge, now engaged in employments which do not occupy their minds as they wish, will find it of great service; and it is to these pupils that the instruction is to be adapted. The tuition fee is certainly moderate enough,—twelve dollars and a half for the course of forty lessons; but it is proposed out of this, not only to pay the salaries of instructors, and the other necessary expenses of the school, but to set aside a certain amount as a scholarship-fund, which will be used to pay the cost of a complete electrical education, at some first-class technical school, of those pupils who, at the annual class examination, show themselves most deserving of such a reward. The names of the members of the Faculty include many of the highest rank among electricians, and such instruction as they will dispense cannot fail to be of great value. Persons wishing for further information should apply to the Secretary, Mr. J. Allan Hornsby, Monadnock Block, Chicago.

MR. H. V. B. MAGONIGLE enters upon his tour of service as holder of the Rotch Travelling Scholarship for the next two years under rather unusual circumstances. Some six weeks ago, after the usual prolonged and comprehensive examination, the scholarship was awarded, without a dissenting voice, to Mr. Magonigle, but no sooner was the award announced than a vigorous protest was entered by the examiner in French, who declared that inasmuch as the scholar-elect had not passed in French, he should not have been allowed to try the final examination, that in architectural design, in which he had actually acquitted himself with signal merit. In addition to this there was at once set on foot a disagreeable murmur, charging favoritism, since the fortunate contestant had been a pupil in the office of one of the founders of the Scholarship. This undertone development of the meanness that humanity seems unable to outgrow, and the fact that the strict letter of the conditions had not been adhered to by their committee, caused the trustees of the Scholarship-fund to declare that they could not recognize the award, and that the examinees must undergo a second test. In other words, for the sake of removing, once for all, the possibility of upholding any charge of favoritism or a lack of strict adherence to the rules, the innocent competitors were made the victims of a second inquisition, in which the original victor had more to lose than did his competitors. Fortunately, the superiority shown in the first examination was upheld in the second one, and, but for the unfortunate loss of time and mental tax, no injustice has been done, while the victor in both contests has won a second leaf of the coveted laurel. As a matter of fact the difficulty was caused by by the French examiner himself, who failed to keep to the rules and make his report to the committee at the proper time, and the committee, who had never known any competitor to fail to pass in French, which is relatively the least important of the examinations—being marked only five on a scale of one hundred, finding that Mr. Magonigle's marks on the other branches were satisfactory, felt themselves justified in allowing him to take part in the finals.

WE find in the *Builder* a short description of one of the decorative paintings in preparation for the Boston Public Library, which is now on exhibition at the Royal Academy in London. It seems that the work shown is "a portion of an arched ceiling, and lunette underneath it," and it is suspended under the ceiling of one of the Royal Academy galleries, apparently in about the position it will occupy in the Library. The *Builder* says that it is explained in the catalogue by a quotation from Psalms CVI, about "serving idols," and thinks that it is "an allegorical representation of Egyptian Paganism, treated in a completely decorative manner, with a great deal of symbolical ornament, partly applied in gilt relief." It is not surprising, in view of this rather startling description, to find that the *Builder* thinks that "it is difficult either to understand the treatment of this large work, or to judge of its effect;" although, "It appears to be a powerful piece of work of its kind." When a critic, especially one with such trained judgment, and so little hesitation in expressing it, as the critic of the *Builder*, finds nothing more to say of a picture than that it is "large;" and "appears to be a powerful work of its kind;" without mentioning whether it may not be of a bad kind, the public may safely fall back on its own impressions; and there will be great curiosity to see it in its place in Boston. The *Builder* thinks that the name of Mr. J. S. Sargent "is perhaps the last name that any one, judging from the character of the work, would have thought of connecting with it." Whether this is intended for a compliment or not, our readers will have to divine for themselves.

A CURIOUS discussion is going on in the St. Louis papers. It seems that sidewalks of artificial stone, under the name of "granitoid," are being laid in the city, and some one, offended at the glare of the white material, wrote to the newspapers to advocate the addition of coloring matter to it. This proposition brought forth what the original writer chose to call "ignorant opposition" from individuals whom he denounced as either "yaller dog Philistines," or "beneficiaries of the granitoid ring." It may be imagined that an æsthetic discussion carried on in this vein does not attract the class of participants best qualified to give valuable opinions, so that the question of what color shall be formally adopted by the city is not likely to be soon decided; but, for brightness and cheerfulness, particularly at night, the white sidewalks are so much superior to those of any other color that it is not likely that they will be soon abandoned.

BEFORE our next number is published, we shall hope to have received the account of the proceedings of the Church-Building Congress, which met at Berlin, May 24. According to a late number of the *Deutsche Bauzeitung*, the Congress promised to be a very successful one. So large a number of persons had responded to the circular of invitation, and asked for tickets of admission, that, even with a liberal allowance for those who would, at the last moment, be prevented from using them, it was estimated that there would be at least four hundred persons in attendance. Naturally, most of these would be architects and clergymen, but a considerable number of persons of other professions had applied for tickets. It is a gratifying evidence of the interest which the German Governments generally take in matters of the kind that nearly all the constituent kingdoms and principalities of the Empire had appointed representatives to attend the Congress. According to the programme, the first event was to be a preliminary reception, held in the great assembly-hall of the Anhalt Railway Station, on the evening of May 23, to afford delegates an opportunity for meeting old acquaintances, and making new ones. The next day, the work of the Congress was to begin, in the so-called "Neue Kirche," after an opening address by Dr. von der Hude, with a series of discourses on the history and development of Protestant church-building, by various theologians and learned persons, followed by what ought to be a very interesting paper, by Professor Gurlitt, of Dresden, on the modern problems to be solved in the design of Protestant churches. After this, general papers, with discussions, were provided for. As usual among the friendly Germans, the evenings were to be devoted to some sort of social entertainment. The evening of the 24th was assigned for a reception in the great hall of another railway station,—that in the Askanische Platz; while the afternoon of the 25th was to be devoted to visiting the newer churches of Berlin. It is to be regretted that, so far as appears, neither the architects nor clergy of this country were to be represented. A number of Dutch, Swedish, Danish and Swiss architects had applied for tickets, but England and the United States do not appear on the list of participants. It is true that in neither of them is the Lutheran discipline of so much importance as on the Continent, but a great deal is to be learned from the sensible and logical planning of the German church architects. Perhaps, taking a hint from the Berlin conference, it might be possible for England and America to arrange, later, for a church-building Congress of their own. The requirements of the service are almost exactly the same in all English-speaking countries, and, while our English cousins might find our corrugated-iron tabernacles as open to criticism as we do their modern-mediæval churches, inclusive of the thirteenth-century air which Mr. Warner found to be the correct aliment for the lungs of the worshippers in such edifices, the mutual criticism would be beneficial to all parties concerned.

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STYLE.[1]— VI.

THE brief investigation that we can now make of the *laws of construction* followed by these artists will surely enable us to recognize, in the Cathedral of Paris, all the *necessary qualities* that constitute STYLE. On constructional grounds, the pointed arch plays such an important rôle in the architecture under consideration, that we are forced to pay especial attention to it. Until the beginning of the twelfth century, barrel-vaults were employed and the transverse ribs consisted of one or two rows of arch-stones devoid of any moulding or ornament; sometimes, the lower row had a semi-cylindrical form; from this time the *berceau* was groined or pointed, the transverse ribs were composed of two rows of arch-stones, the upper of which, in the first half of the twelfth century, was adorned with a torus or a groove, to relieve the arris. It was not until the close of the twelfth century that the transverse ribs came to comprise a bundle of tori separated by cavettos; but, about the middle of the thirteenth century, these ribs took three rows of arch-stones, while the ogives had but one. The object of this change in the construction of the transverse ribs was to strengthen the resistance of the vertical pressure of the most loaded parts; for the doors, which were provided with lintels, the archivolts served as discharging-arches. The construction, therefore, consisted of transverse ribs, diagonals and *formerets*. These projected and were built of larger stones than the vaults themselves, which were filled-in with unhewn stones and were independent of the structural system, that is to say, formed genuine spandrels. In the middle of the twelfth century, architects adopted the pointed form for windows in Ile-de-France; these were usually placed directly in the *formerets*. At Notre-Dame, every other one of the middle pillars, between the two side-aisles, is more robust than the one next it, because it has a greater weight to bear. Flying-buttresses date from the twelfth century; previous to this time, the churches had timber roofs, with the exception of the apse, which was covered with a hemispherical dome in masonry-work; after unsuccessful efforts to make use of the half-barrel vaults inherited from the Romanesque epoch, which rendered the excessive thickness of the walls useless where there was no thrust, and inadequate at the points where the transverse and diagonal ribs ended, flying-buttresses and buttresses, tipped with pinnacles, were introduced. The thrust of the ogive arch is established by reason of the slipping of the stones from the springing half-way up, so that the spaces between the *formerets* became very slender, as of no account, when the flying-buttress was contrived to counteract the thrust of the vaults and their framework of ribs; but the normal buttressing of the vaulting possessed the defect of bringing too much weight on the piers; this led architects to adopt a system of oblique buttressing. Every part of the edifice was calculated with a view to securing a maximum of resistance for a minimum of material, a difficult and logical solution of the problem of obtaining a good construction cheaply.

As for the decoration, that was also wisely employed and every arch-stone, in the noble epoch of the style, contained in the mass of its stone the development necessary to its ornamentation. After having copied Roman models, sculptors abandoned these, as they no longer satisfied the needs of the time, and turned to Byzantium in search of new types. However, the monks of Cluny, who in the matter of drapery had been influenced by paintings and ivory-carvings brought from the East by the Venetians, succeeded in imparting some life, in physiognomy and attitude, to their figures. Such was the starting-point of numerous efforts, which, after a more thorough study of nature, led the sculptors of the Middle Ages to an expression more in conformity with the national taste.

Painting, in the Gothic period, as well as sculpture, formed one with architecture; its earliest examples had been inspired by the Byzantine style, but it had afterward drifted away from this source and had approached more nearly to the teachings of nature. In the twelfth century, the backgrounds are light, and the subjects are expressed by a line and a few hatchings, in white to indicate the light, while the shadow is represented by a few hatchings in brown; a brown line always indicates the drawing and separates the colors, which are: yellow-ochre, light red-brown, several shades of green, rose-purple, light violet-purple and light blue.

[1] From the French of Léon Labrouste, in Planat's *Encyclopédie de l'Architecture et de la Construction*. Continued from No. 962, page 97.

Gold is introduced only for halos, stitches or embroideries; it is never employed as a background, as was the case in the Byzantine style. Two colors of equal value are rarely placed side by side without being separated by one of different value. In the thirteenth century, the system of tones changes — the backgrounds are deeper — an intense blue, dark red, and sometimes black or embossed gold. The predominant colors are blue and red; green serves as a transitional shade; yellow-ochre is used only in small parts, and the colors are separated by a very deep brown or even black line; the modelling blends with the color employed; in a word, the vigor of the coloring is being accentuated more and more, and this is still true at the close of the thirteenth century, so that the flesh and drapery are lighter in tint as the backgrounds become bolder. The latter, after having exhibited a very timid and harmonious scheme of color in the twelfth century, and later a more vigorous one, are now covered with thin half-tones.

The colors are light rose, light green, rose-yellow, light blue, white, gray white and greenish white; the draperies are sometimes polychrome and the flesh white. In the fourteenth century, painting loses somewhat in warmth, but the drawing is more accurate and the backgrounds, simple as they have been, are now loaded down as though with real mosaics. The paintings of the twelfth century were executed in fresco or with gum, while those of the thirteenth were done with egg or a size made from parchment, or with resin. The subjects produced no illusive effects, for perspective was wanting until the sixteenth century. At the close of the twelfth century, painters found a new field for their art in its application to glass.

The finest productions in glass-painting date from this period. The colors in use were blue, yellow, red, green, purple and white; but, while artists employed the same processes here as in their mural paintings, they calculated carefully the effect of the different shades as seen side by side through a transparent medium; moreover, they succeeded in taking advantage of the defects of the material, so as to add to the vigor of the modelling; and this enabled them to attain to such a degree of perfection that fresco painting appears to have been somewhat neglected for painting on glass, from the thirteenth century. In the stained-glass of the thirteenth century, the backgrounds are blue, or red, or yellow, while the ornaments and subjects are in two greens, two purples and two light blues, with different shades of white. The blue backgrounds were painted along the edges to check the radiation of this color; on the red backgrounds, only a little blue was introduced near them, in order to avoid the harshness and coldness that result from liberally mixing these two colors. The leads, geometrically arranged, now followed the artist's design, or his fancy, and assumed a perfectly free disposition. The stained-glass windows of the sixteenth century lack light; they are false in tone and of a red hue.

Comparing this review of the highly rational, constructive and decorative systems of Gothic architecture with the end that Gothic masters had in view, one sees that the *purity* of the forms fixed by them and the *propriety* of the destination of the edifice, as well as the *precision* and *clearness* with which they responded to the requirements of the programme, in a manner so *natural* and by means satisfying the smallest demands of *appropriateness*, render Notre-Dame of Paris eminently a work of STYLE. Thus, the materials, following their nature and the laws governing them, compared with the use to which each was called to contribute, according to its function in the *ensemble* of the work lovingly longed for, clothe an appropriate form; such had been the secret of the great artists of all ages, such was the philosophy of mediæval artists — a philosophy whose expression is so clearly detected in the so-called Gothic monuments, and which had stamped upon them those indispensable qualities, without which no production can endure the test of time.

Archæology and history tell us that the corner-stone of Notre-Dame was laid in 1163, by Pope Alexander III, and that the dedication of the high-altar took place in 1182. The Cathedral was begun by Maurice de Sully, archbishop of Paris; he continued the work until the time of his death, in 1196. It was carried on by his successor, Eude de Sully, from 1197 to 1208. The western façade was commenced about the year 1215, toward the close of the episcopal reign of Pierre de Nemours. In 1223, on the death of Philippe-Auguste, it had been completed as far as the open gallery; the towers were finished in 1235. At this time, the church consisted of a

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single nave terminating in a circular apse, the whole surrounded by a double side aisle, with a gallery above the inner one of these; the flying-buttresses were constructed with two arches. The fire of 1240 destroyed the woodwork, after which, in 1245, the size of the high windows was altered and the flying-buttresses were rebuilt with one arch; then chapels were reared on either side of the nave, between the buttresses. In 1257, under the reign of Saint-Louis, Jean de Chelles prolonged the transepts, and in 1296, the series of chapels was completed by carrying them around the apse.

What practical method have we adopted to determine the style? The monument, a tangible, visible object, is the starting-point of our investigations; the characteristic, which gives the sentiment, is our goal. We have, then, analyzed the edifice to obtain the characteristics. If, on the contrary, the sentiment revealed to us by the characteristic, serves as our starting-point, the tangible, visible monument becomes the goal. In this case we make an analysis of the sentiment in order to reconstitute the monument itself synthetically.

To sum up, we will, then, say that the following is the method proposed for an archæological inquiry into architectural style, from a philosophical standpoint; we believe also that it can be employed hereafter for the creation of an architectural style, should a new dominant need make itself felt:

ANALYSIS OF STYLE.

General qualities: — Purity, propriety, precision, clearness, naturalness, appropriateness.

Laws of construction: — Stability of the materials employed according to their natural fitness.

Laws of æsthetics: — Rational knowledge of beauty, leading through truth to an analysis of the meanings, in order to arrive at the sentiment, and discover the characteristic.

Archæology: — Confirmation of the results by historic facts.

SYNTHESIS OF STYLE.

Laws of æsthetics: — The characteristic being obtained from the sentiment experienced, arrive at the truth through an analysis of the meanings, thence reaching a rational knowledge of beauty.

Laws of construction: — Stability of the materials employed in accordance with their natural fitness.

General qualities: — Purity, propriety, precision, clearness, naturalness, appropriateness.

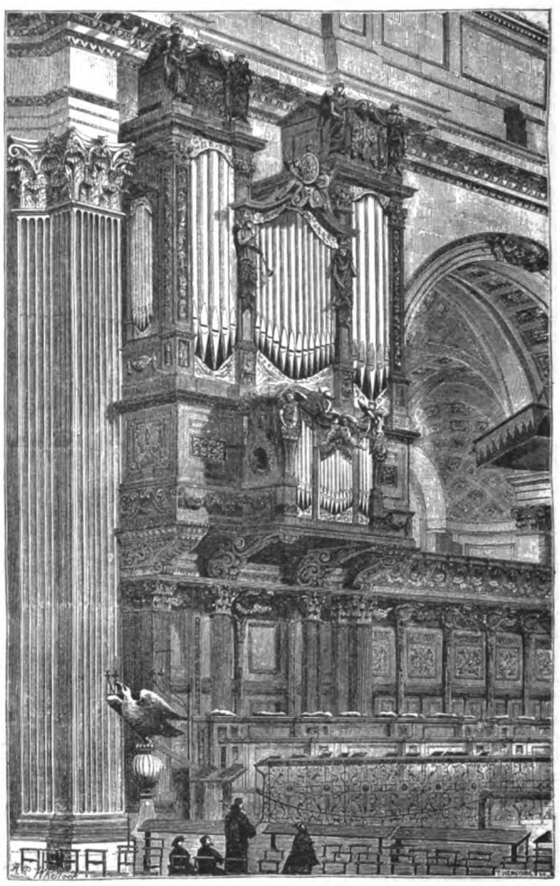
Archæology: — Confirmation of historic facts by the results.

It is not always equally possible to make an analytical or a synthetical study of an edifice, although the one must always be a verification of the other; the method to be employed depends upon the state of preservation of the monument. When it is so well preserved as to enable the student, on seeing it, to experience a sufficiently complete sentiment to restore it to its primitive condition, the synthetical method should be followed; if, on the other hand, the structure is so ruined as not to evoke a sentiment keen enough to image it at once in its former state of splendor, it is better to take it part by part and follow the analytical method.

It may be said, in conclusion, that we of the nineteenth century are borne along by certain artists in a path where the fundamental principles and the characteristic of our architecture seem to have been set aside and superseded by eclecticism and lack of faith; while others are seeking originality in oddity and whimsicalness and are striving to vitalize their art by a total disregard of tradition, balance and frankness. Progress consists in moving toward the light, toward truth, so as to satisfy the demands of reason. It cannot, however, be gainsaid that there are a few artists at the present day who cling to truth, and are in the way of progress as here defined; their productions will furnish undeniable evidence of the style of the time, a style evolved from our mode of living, from our needs and hopes, from the economic ideas brought into play in our means of satisfying these, from our political life, both domestic and foreign, so wonderfully developed during the second half of this industrial rather than agricultural century, and whose originality is due to the novel interpretation of its programmes. These influences and currents have perhaps too deeply marked the works of our troubled period, in which the struggle has grown, while undergoing a transformation through the disappearance of individualism before a common collectivism; but whenever freedom and wisdom have presided over the execution of our programmes, we can boldly say that posterity will recognize our arts by these peculiar features and will clearly read in them our dominant endeavors, without hesitating to assign a date to such works, stamped with the seal of the style.

Leon Labrouste.

THE POSITION OF THE CHOIR AND ORGANS IN CHURCHES.[1]



The Choir Organ, St. Paul's, London, England.

In Mediæval times, and, in fact, as a general rule, until some thirty or forty years back, the organ gave an architect little trouble. As long as it was inclosed in a case some 10 ft. by 5 ft., and about 16 ft. high, it could be placed almost anywhere, and it did not demand consideration in planning a church; but when the same thing becomes a structure 20 ft. square and 30 ft. high it can no longer be ignored. and provision must be made for it or it will become a serious disfigurement to the building. The difficulty must be boldly grappled with. It is simply useless for an architect to complain of the size of an organ or to suggest that it should be made smaller, so as to occupy less space; he might just as well complain of the size of a dining-table when he is designing a dining-room. The thing is wanted, and must be provided for, and the architect must discover some means of meeting the difficulty. I acknowledge that it is often a serious difficulty, but there is not the slightest chance of its vanishing or even becoming modified, as in all probability organs will get larger and larger as time goes on. All attempts at decreasing their size have hitherto proved complete failures.

There are, of course, several things to be taken into consideration in selecting the position for an organ. The first, and most important is that the instrument should be placed where it will be heard to the best advantage. The second is that it should be in such a situation that it may be serviceable both for the choir and also for congregational singing. The third, that it should be placed where it will be secure from injury arising from damp, excessive draughts, variations of heat and cold, and, especially, leaky roofs: the gutter of a roof should never, under any circumstances, be carried over an organ; yet, in two new churches which I have lately seen, the organ is placed under the valley between two roofs. In another church, recently restored at great expense, I noticed a few weeks since that the gutter over the organ was insufficient; the consequence was that the open diapasons were receiving a regular *douche*, and the water was running out of the

[1] A paper, by H. W. Brewer, read before the Architectural Association, February 2, 1883, and published in the *Builder*.

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lips of the pipes! I pointed this out to the sexton who was showing me over the church, and he said, "Well, sir, our organist *do* complain. A few Sundays back the water came down on his head during morning service; but what can be done? Our parson has spent a deal of money over that roof!" I suggested that at any rate the organ ought to be removed. Lastly, an organ must be placed in such a position that it is, if not an ornament to the building, at least no disfigurement to it.

Now, there are not many positions which a large organ can occupy in a church so as to fulfil all these conditions, and it is not surprising that it should have created a new feature in church architecture,—the organ-chamber,—which seems to be popular amongst Anglican clergy, as it is to be found in very many new churches, and has been added to not a few ancient ones, sometimes, I am bound to say, not to their improvement. It is, in fact, greatly to be doubted whether it is always advisable to remove an organ from the western gallery where it has formerly stood, to place it in a kind of black-hole at the side of the chancel. This is often done under the idea that the position is more in accordance with ancient usage; but in point of fact, while there is plenty of Mediæval authority for the western choir and organ-gallery, there is none that I know of for an organ-chamber, which is an essentially modern feature in church architecture. Ancient organs in western galleries occur at Amiens Cathedral, the Cathedral of Constance, St. Mary's, Lübeck, St. Anne's, Augsburg, and St. Ulrich's, Augsburg; and although the organs have disappeared or have been rebuilt, ancient western organ-lofts are to be seen at St. Stephen's, Vienna, Ulm, Liège, St. Mary's, Würzburg, Ochsenfürth, the Carmelite Church at Boppard, St. Pantaleon, at Cologne, etc. The last-named example, however, is so singular in its arrangement, that it may have been removed from some other position.

The reason for placing the organ in an organ chamber is that it may be near the choir, who are now usually placed in the chancel. Whether the choir of laymen was, in the Middle Ages, commonly placed in the chancel seems doubtful. That the chancel was nothing like so universal a position for the singers as is generally supposed, seems proved by the arrangement of many ancient churches; for instance, in the old Abbey Church of Cornelimünster, near Aix-la-Chapelle, the choir, with its stalls and complete ritual arrangement is to be seen in the western gallery. The same is the case in one of the earlier of the abbey churches, that of Seligenthal, near Landshüt, where the front of the choir gallery is adorned with a series of beautiful old pictures, and the interior fitted with regular choir-stalls. The same arrangement is to be noticed at the Abbey of St. Maximin at Tréves, though, unfortunately, here the whole of this interesting portion of the church is much modernized. At the minister church at Roermond, the arrangement of the choir was very singular; it was divided into two parts, each of which occupied one of the triforia of the nave. Each triforium choir terminated to the east in a small apse, bracketed out into the transept, containing an altar, both of which still exist. The original high-altar also exists, not in the great apse, but in a smaller apse projecting from its eastern extremity. Mr. Cuypers, who has very carefully restored this church, believes the position to be original. There is a rather later western organ-gallery, but the whole is thirteenth-century work. The curious church called the Alte Pfarrkirche, at Ratisbon, contains a singularly small chancel, only about 10 ft. square, but has a very deep choir gallery at the west end. The stalls have been removed, but the marks of where they were fixed can still be traced; the date is thirteenth century. At Coburg, there was evidently a western choir in a gallery, with a little apse built out over the principal doorway; the arrangement is very picturesque externally. At Limburg-on-the-Lahn, the great triforium, which is vaulted and furnished with several altars, is called the "männerchor"; whether it really served the purposes of a choir is a question which it is not possible to settle, but the name would seem to suggest it.

Notwithstanding the fury which has of late years been exercised against western organs and choir galleries, there is much to be said in their favor, and it would perhaps be well to hesitate before removing them, especially in old churches. The west end of a church is an excellent situation for a large organ, both musically and as regards its appearance. The splendid examples at Lübeck and Boisle-Duc, and St. Anne's, Augsburg, serve to show what a fine feature can be made of an organ in this position. Musically speaking, also, the western gallery is a good position for a choir, and the arrangement lends itself very well to congregational singing. Much good carving and excellent work has been destroyed by the wholesale removal of west-end organ-galleries. I cannot help also regretting the destruction of the numerous fine Rennaissance organ-cases which have disappeared, together with the western organ-galleries.

The organs in cathedral churches, in England at any rate, were generally placed upon the chancel or rood-screen, and it is impossible to suggest a better situation for the instrument, as every single favorable condition is here complied with. The organ has plenty of space about it, and it is consequently sure to sound well. It is away from any walls which could convey its sound out of the building; it is excellent for choir-work, and also for congregational purposes; it is more safe from damp and draughts than in any other part of the building, and less liable to variations of temperature. The position has also the sanction of antiquity, as it is recorded that there were organs upon the rood-screens of Durham, Peterborough, York and Winchester cathedrals, long before the Reformation. In Continental churches a few organs still exist in this position. The Cathedral of Bruges, and that of St. Gomarre at Lierre, are cases in point, though, singularly, in the latter church, the organ is sunk into the screen in such a way as to be invisible from the nave of the church. The removal of organs from choir-screens has been greatly in favor of late years, but I trust to live to see them all replaced in their former position. It seems that King Charles I inaugurated this movement by ordering the removal of the organ in York Minster, because it prevented the great east window being seen from the nave. It was, however, subsequently replaced.

When the organ is placed upon the choir-screen, one of two things seems to suggest themselves; either the congregation should be excluded from the choir, or the singers should be placed in the organ-gallery. The present plan of mixing up the congregation and singers in the choir-stalls of the English Cathedrals, has many great objections. In the first place, it is not edifying to look down the throat of a man just opposite who is singing a solo, nor is it advisable to recognize too distinctly any individual singer in a church. One may have heard him sing music of a very different character, under very different circumstances, which it is undesirable to associate with his present performance, and yet the mind cannot help making this association, to the entire destruction of all solemn thoughts and religious feelings. It is also a great advantage to every choir to have a conductor, and not to trust too implicitly to the organist. Where music in the style of Palestrina is sung unaccompanied, a conductor becomes absolutely necessary. Now a conductor is strangely out of place in the middle of a congregation.

The destruction of choir-screens, both here and on the Continent, is to be regretted. Not only are these screens great ornaments to churches, but they are of considerable use for musical purposes. The magnificent rood-screens at Münster and Bois-le-Duc were, when I first recollect them, used positively as choir-screens, and the effect was remarkably fine. Both have now, unfortunately, been removed. I am told that the screens at Tournay and Bruges are threatened with the same fate, chiefly because they are not Gothic! Some years back the choir of Norwich Cathedral sang from the screen, and I fancy there must be ancient authority for this usage. In France the rood-screen is called "*jubé*," and I cannot help associating this name with the first word of the Complin service,—"*Jube, domine, benedicere.*" Possibly the Complin service may have been sung from the rood-loft, and hence the name "*jubé*," as given to this feature of church architecture. In Germany the rood-screen is called by a different term in almost every church. At Münster it was called "Apostelngang," — I fancy, from the statues of the Apostles which adorned it. At Halberstadt it is called "Bishofstuhl" or "ambon": whether it really served as a bishop's throne or no, it is impossible to say. At Hildesheim it is called "Letner," a word closely akin to our word *lettern*,— probably because the Gospel was read from it. It should be noted that, although the rood-screen has generally been destroyed in France, yet the Gospel is always read from the place where it formerly stood. In some old descriptions of churches I have found the words "*pulpitum*," "*paradisus*," used to signify the rood-screen.

Another position for the choir is to the rear of the altar. It is certainly the most ancient of all positions, as may be seen by the arrangement of the basilican churches. It is an excellent position from every point of view, and remarkably convenient, especially in apsidal churches. The great difficulty, however, is the organ. In French churches, where this arrangement is not uncommon, there are generally two organs,— one a small instrument for the choir, and the other placed in the nave of the church for voluntaries and congregational purposes. The disadvantage of this is, of course, its expense, as it necessitates two organs and two organists. I am aware that there is an invention by means of which the same organist can play both organs at once by the application of electricity. It would be very desirable that this invention should succeed, but owing to the expense, or some mechanical difficulties, it has not met with the success which one could wish. I trust, however, that it will not be lost sight of, for, if it could be made thoroughly practicable, it would solve many difficulties, and it may turn out to be of the greatest possible value, both from an architectural and musical point of view.

The choir of Ratisbon Cathedral, which is justly celebrated all over Europe for its efficiency, consists of two separate bodies of voices, one composed of clergy, theological students, etc., who are placed in the stalls in front of the altar, and sing the plain chant; and the other of professional singers, who sing the harmonized music, and are stationed in the apse, behind the high-altar. The organ is immediately behind the reredos; it is a small, but singularly good instrument, so far as it goes. Above the stalls, on either side of the choir, are stone galleries bracketed out, which are reserved for the use of the clergy of distinction who are unconnected with the cathedral; this seems to me to be a very excellent idea,— one which might well be adopted in other places,—because it obviates a difficulty. Strangers ought never to be admitted into the stalls of a cathedral under any condition whatever; yet it is desirable to have some place for foreign ecclesiastics visiting the church. While I

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was at Ratisbon I noticed that one of these galleries was occupied by an Armenian bishop and his attendants. I must here call attention to a somewhat remarkable, but very successful, experiment which was made at this cathedral some years back. The plan of the cathedral is remarkably symmetrical, and when it was restored, numerous positions for the professional choir and the organ were suggested. Both were removed from place to place, to discover where they would be most effective. The organ, which is, as I have said, a small instrument, was found to be totally insufficient everywhere, except when placed in the apse, where, owing to some extraordinary acoustic properties of the building, it has the effect of a large and powerful instrument. It was also discovered that the same effect was produced by the choir, so that a body of some twenty voices was found to produce the effect of a very large choir; it was, however, found necessary to play and sing the music very much slower than it would be ordinarily taken; a false note or a breakdown would, of course, be multiplied fourfold, and what would be the result of a cypher on the organ I tremble to think. Such things, however, do not happen with the Ratisbon choir, and I do not think that anything could surpass the superb unaccompanied music of Palestrina as rendered by this choir, and in this cathedral; it seems to wind round and about the lofty columns and in and out of the stately arches in a way that baffles all description. I went to the church over and over again before I could discover where these grand waves of harmony proceeded from. This is the only case I know of in which the choir and organ have been placed and arranged with a view exclusively to the acoustic properties of the building, and yet one would naturally have expected to find such a proceeding rather the rule than the exception. The arrangement of organ and choir behind the high-altar is not uncommon in France, and wherever I have heard it, the musical effect is remarkably good.

In cruciform churches one of the transepts is an admirable position for the organ. A very fine and effective instrument has been erected in the south transept of Worcester Cathedral.

The aisles of a church are not a good situation for organs without they are like those in the German churches,— remarkably lofty. Ancient organs in this position are to be found at St. Afra, Augsburg; at St. Stephen's, Vienna; at Nordlingen, in Suabia; at Ingolstadt, in Bavaria; and at the Cathedral of Erfurth. The organ-lofts in each of these cases are very charmingly-designed; all these churches, however, possess an organ at the west end in addition to that situated in the aisles. There is a gallery at the west end of the north aisle of Winchester Cathedral which was probably formerly an organ-loft, though we know that the principal organ of that church stood on the rood-loft. Another very favorably ancient position for the organ was in a gallery bracketed out from the triforium of the nave. The ancient organs at Chartres, Freiburg, and Strasburg are in this position, and in all probability the so-called minstrels' gallery at Exeter was nothing more than an organ-loft. We know also that, in addition to four organs in different parts of the church, Durham Cathedral had an organ corbelled out from the triforium of the nave. Although it is a fairly-good position for a moderate-sized organ, yet it has several drawbacks; the organ is generally too high up to be quite satisfactory, either for accompaniment or as a solo instrument. Undoubtedly an organ sounds better when raised above the level of the heads of the congregation, but some of its tones must be lost when it is raised some 50 ft. or 60 ft. above the pavement.

Old organs were very frequently placed over the choir-stalls. That of the old Cathedral of St. Paul was in this situation, and the Cathedral of Milan and many Spanish and Italian churches are examples in point. Unless, however, the choir projects west of the transepts, so that the organ can stand under one of the arches of the crossing, there is scarcely sufficient space for a modern organ of large dimensions, and it has led to the very objectionable practice of cutting the organ in half, and placing one half on one side of the choir and the other half on the opposite side, the two being connected by trackers underneath the floor. It is useful, however, sometimes, to have a small organ over the stalls when there is a large organ in another part of the church. This is the case at Worcester Cathedral.

We sometimes, though very rarely, find old organs placed on the ground to the east of the stalls, and it is to be remarked that the only pre-Reformation organ-case existing in England, that of New Radnor Church, is in this position. Occasionally the organ is placed on a gallery at the back of the altar. Handel's organ at Whitechurch is in this situation; both organ-case and choir-gallery were designed by Wren. In some of the Lutheran churches in Germany the organ is over the altar. It is so at St. Anne's, Augsburg, but there the altar is the intruder, as the fine old organ holds its original position at the west end of the church, and a modern altar is placed under it. I think it was at Ludwigsburg I saw a singular three-decker arrangement,— not pulpit, reading-desk, and clerk's desk, as one sometimes sees in England,— but an altar below, a pulpit immediately above the altar, and an organ above the pulpit.

It is now customary to place the organ in a chamber at the side of the chancel. I find that this arrangement is almost universally condemned by musicians, and especially by organists. A correspondence upon the subject has recently taken place in the *Musical Standard*, and the vote was strongly against these structures. A very eminent organist lately told me that it was about as bad a position as could possibly be found for an organ, and for his part he would as soon see the organ placed out on the opposite side of the street. I will here relate the objections to organ-chambers which I have heard advanced. (I am not now giving you my own opinion, but that of those who are far more able to judge of the matter.) It is advanced that an organ, like all other musical instruments, requires to be placed in an open and isolated position, and that it should never be inclosed or surrounded, except by its own case. We know that when a good pianist wants his instrument to sound well, he draws it away from the wall, and opens the top, so that there shall be nothing to intervene between the instrument and his audience. And it is even more important that an organ should be unencumbered by surrounding objects than a piano, because the organ consists of at least two parts or subdivisions, the most important of which is called "the great organ," and the less important "the swell organ." Now, the characteristics of the great organ "should be power, grandeur, and distinctness of tone, and the "swell" should be more subdued, sweet, and gentle, with a contrivance for producing variety as to *piano* and *forte*. The contrast between the various portions of an organ form one of its greatest merits as an instrument, and these contrasts are effected by certain mechanical means. The "great organ," for instance, demands a clear space to give forth its majestic tone, the "swell" requires to be inclosed, but to be able, when wanted, to break away from this inclosure and give forth a fine *crescendo*. This is effected by a contrivance somewhat resembling Venetian blinds. If there is a choir-organ, it should be clear, delicate, and very sweet in tone. Now, when the whole thing is shut up in a box,— and an organ-chamber is really little else,—much of this wonderful contrast is gone, because the very conditions demanded by the instruments are unfulfilled. But some people may say, "Oh, I like the subdued tone of the organ, and cannot bear to hear it when it is loud." An unfortunate organist wrote to the *Musical Standard* a few days back that he was absolutely forbidden by the clergyman to play anything but soft voluntaries on the instrument, and was ordered not to play Bach's fugues, because the same clerical authority considered them "undevotional"! Now to such people as this what I should say is, "Why on earth go to the expense of a powerful organ, when, for 8*l*., you can get a harmonium which will be better suited to your taste, or want of taste?" It is surely folly to pay for grandeur of tone and power, and then shut them up in a box where they cannot be heard. Yet this is very frequently done. I have often heard really good organs, crammed into organ-chambers, which have, from their unfortunate position, had little more effect than a harmonium. Sometimes, to make matters worse, the organ-chamber will be enclosed by low arches and screens of wood or stone,— all forming a carefully-constructed sound-trap or gag. The fact is that when the organ is placed in an organ-chamber, the "great organ" is reduced to becoming a "swell organ," without the power of producing *diminuendo*, or *crescendo*. As a rule, also, organ-chambers are far too small to hold an efficient instrument, and the various parts have to be crowded together, and this is always bad. Mr. E. Turpin, the eminent organist, writing in the *Musical Standard*, gives 20 ft. by 20 ft. by 20 ft. as the smallest sounding-space for a church organ; yet how few organ-chambers are of these dimensions. Another defect in organ-chambers is the fact that they are nearly always damp. Now, damp is sure ruin to an organ. Then, also, an organ is difficult to get at when blocked up in a chamber. It is most important that every part of an organ should be easy of access, otherwise it may be absolutely necessary to take down nearly the whole of an organ to remedy some trivial defect which an organist himself could easily rectify if he could obtain access to that part of the instrument where the defect lies. The great organ at Bois-le-Duc is admirably arranged in this respect, being furnished with a staircase and galleries inside.

From an artistic point of view much has been lost by the organ-chamber, which is nearly always an ugly adjunct to a church. Directly organs are relegated to the chamber, they no longer come under the attention of the architect, and that singularly-beautiful article of church furniture, the organ-case, is abandoned. But as long as the organ occupies an important position in the building, the case must be carefully designed, and when one sees how magnificently the Mediæval and Rennaissance men treated that architectural feature, one cannot help wondering why it so rarely receives any attention at the present time. There are, I am glad to say, some few exceptions, and fine cases have been erected at Worcester, Hoare Cross, and Manchester, and have been designed for St. Margaret's, Westminster, and St. Martin's, Brighton. It is, however, very strange that, as a rule, the only portion of an organ which it is attempted to decorate are the pipes. This is certainly a work of supererogation, because the pipes of an organ are sufficiently handsome in their natural condition; whereas the deal-posts and match-boarding, which generally do duty for a case, would certainly be none the worse for what our Yankee cousins call "a lick of paint." If people are very rich and anxious to spend money upon an organ, they should have the pipes embossed. One paints iron to prevent rust, but it seems repugnant to one's feeling to paint tin. I do not, however, propose to detain you by remarks upon the artistic treatment of organ-cases, because this subject is dealt with

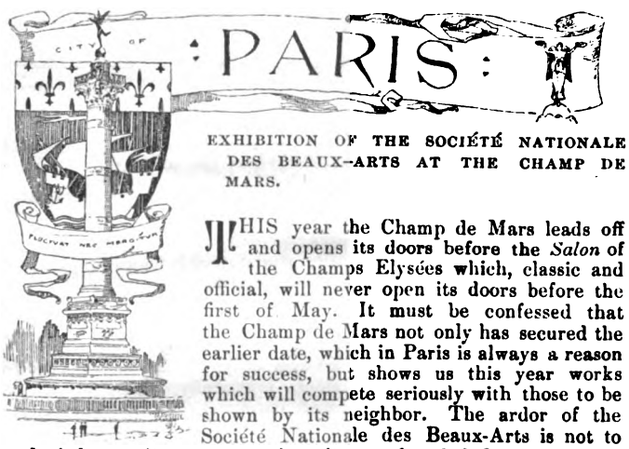
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in a very complete manner by Mr. A. G. Hill, who, in his work upon the organ,—about to be published,— has illustrated and described all the most important examples at present existing in Germany, Holland, Belgium, France, England, and some few even in Italy and Spain. Most of these are reproduced from Mr. Hill's own sketches. By rare good luck Mr. Hill has also become possessed of many curious engravings of old organ-cases now destroyed. To the artistic value of the work he has been able to add much practical information gathered from personal experience as a partner in the well-known firm of Hill & Sons,— which is, I believe, the oldest firm of organ-builders in England.

I now come to the question, "What is the best position for an organ in a church?" And in consulting several eminent organists, I have nearly always received the following reply to the question: — "Either some central position as much isolated as possible, or a western gallery." Now, the objection to a western gallery is, that although it is admirable for sound, people, and especially the Anglican clergy, are opposed to having the choir so far removed from the altar. But I venture to think that the central position might be managed. It certainly suggests a choir-screen of some kind or other; and why should not the choir-screen be constructed in the form of a solid arch or bridge crossing the eastern bay of the nave? This need not occupy any space upon the ground-floor of the church, because the nave benches might be continued under it to its eastern extremity, or the choir might be carried on to its western extremity. If the first plan were adopted, the organist would sit in the gallery above the arch; but if the latter were carried out, he would play from the west end of the choir-stalls, under the arch. I have ventured to show how this arrangement might be carried out.[1] It may be objected that this scheme gives very great prominence to the organ, but I would ask, Why should not an organ occupy a very prominent position in a church? It generally costs more than all the rest of the church furniture put together. It is, as I have shown, becoming every day a more and more important adjunct to divine worship. It is capable of the highest artistic treatment and architectural development. Why, then, should it not be brought boldly forward and placed in a situation worthy of the king of instruments? In the Middle Ages the organ was regarded with the most extraordinary reverence, and we find St. Peter Damian, in his exquisite hymn "De Gloria Paradisi," enumerates the tones of the organ amongst the joys of heaven. Now, it so throughly describes what an earthly choir ought to be that I venture to quote it: —

"Novas semper harmonias,
Vox melodа concrepat;
Et in jubilum prolata
Mulcent aures organa."

("Lovely voices make a concert,
Ever new and ever clear;
And in never-ending festal
Organs soothe the ravish'd ear.")



EXHIBITION OF THE SOCIÉTÉ NATIONALE DES BEAUX-ARTS AT THE CHAMP DE MARS.

THIS year the Champ de Mars leads off and opens its doors before the *Salon* of the Champs Elysées which, classic and official, will never open its doors before the first of May. It must be confessed that the Champ de Mars not only has secured the earlier date, which in Paris is always a reason for success, but shows us this year works which will compete seriously with those to be shown by its neighbor. The ardor of the Société Nationale des Beaux-Arts is not to be denied, nor its progress since it was founded five years ago. Hampered at the outset by all those incapables who seek success only through notoriety or, as we call it, through *le pétard*, and restricted to a rather small number of exhibitors, its beginnings promised but a doubtful outcome. It was to be feared that, "bucking against" a society so classic and well-established as that of the Artistes Français, it must be defeated in spite of all efforts. Its audacities might turn out ill, or at any rate be surpassed by those of the so-called independents, impressionists, symbolists or *décadents*, who under these empty and pretentious titles conceal their ignorance and folly. To appreciate their work one must see what these lunatics and buffoons have succeeded in accomplishing and exhibiting in certain show-windows. There is still an unquiet feeling about the works of these hair-brained enthusiasts. It is asked whither shall we go if this malady increases and what will become of the French school if the crowd, through fashion, indifference or unhealthy curiosity, follow after these crazy ones, these Barnums, if only to laugh at them?

In 1890, at the time of the first exhibition at the Champ de Mars people laughed more or less. The members of the Society, for the sake of making a presentable show in point of quantity, had to endure the propinquity of wholly unworthy neighbors. Talent had to be sought for amid a ruck of mediocre work, and always, for the sake of covering the walls, the members have been allowed to send an indefinite number of their works, sometimes a dozen or fifteen being hung. Architectural work was conspicuous by its absence, sculpture was poorly represented and the new department of *Objets d'Art* was still more modestly supported. But the founders of the new *salon* had abundant energy and perseverance. There was, in especial, the will to break with classic routine, the feeling of the need of being more modern, more elegant and more youthful, and by these urgings the younger element felt itself attracted and encouraged. It is now evident that every new experiment will be better received at the Champ de Mars than at the Champs Elysées where art will remain, doubtless, more reasonable and where, if habits do not change a little, the researches and experiments of new men and the interest that results from the inevitable imperfection of beginnings will be lacking.

During these five years the number of Members of the Society has increased, as well as the number of Associates, and this year the Members were allowed to exhibit only eight paintings, but even this is too many, although all have not exhibited the permitted number. At all events, the exhibition of the Société Nationale des Beaux-Arts is this year a very brilliant one and has been organized with perfect taste. In place of the interminable galleries, the committee arranged a series of little *salons*, furnished and decorated in a most delightful manner with paintings and *objets d'art*. Except for the turnstile at the entrance the visitor might well fancy himself about to pay his respects to some young and fair Parisian dame in the midst of her household gods. The sensation is charming; but evidently this is not enough and the visitor ought to derive pleasure from the paintings and curios collected by this would-be artist. What she exhibits should move the beholder and cause him to think. Now, I do not know what the Champs Elysées have in store for us, but to surpass what we see here will be difficult indeed. We still find here the product of a nervous and unhealthy condition of the artist, rather than true works of art. But, independent of other remarkable works, there is one here which commands the respect and admiration of every one by its importance and the faith that has inspired its creator. In truth, after a period of naturalism carried to the farthest limits, and of vulgarity, art in France has for some time past been undergoing a very curious reaction, turning toward the ideal and even the mystic. This reaction causes the artist to seek out all those grand and glorious figures in whom the human element is measurably effaced in the legendary and supernatural. Napoleon I, upon whom literature and the theatre has seized, is now the artist's theme; so, too, is Joan of Arc, in whose honor a grand ceremony has just been performed at Notre-Dame de Paris. The moment was well chosen, therefore, to interest the public and artists in a colossal work which presents the grandest personality of all humanity, Christ himself. For the last eight years M. James Tissot, a modest and persevering artist, has consecrated himself to the gathering at Jerusalem, Nazareth, Gethsemane and wherever else Jesus tarried, according to the accounts of the Evangelists, all the data and documents necessary for the representation of types, buildings and all the accessory details of the epoch, all with the intention of placing before us a study of the life of Jesus. To resuscitate, as in a vision, the impassioned but human drama which still moves the whole world was a colossal undertaking. Setting aside beliefs, religions and ideas, and only considering what I purposely style the drama, this work of M. Tissot's astonishes, moves and gives rise to thought. Two halls especially decorated in a primitive architectural style have been devoted to it. The entire work will consist of three hundred and fifty compositions, of which only two hundred and seventy are exhibited this year. Quite small in dimensions, these compositions follow, word for word, the stories of the four Evangelists and are divided into five series: Infancy, the Call, the Holy Week, the Passion, and the Resurrection. Without being expansive over the rare merits of this extraordinary work, I will be content with insisting on the captivating qualities of this poem which moves and yet holds one spell-bound. It is almost impossible to avoid examining all these little paintings, from first to last, so closely are they connected one with another, like words in a single phrase. Poetry, sentiment, suffering and faith find in M. Tissot's work the interpretation and accent of the very essence of art, which at times have the merits of an inspired vision.

Another artist, one always interesting to us architects, M. Puvis de Chavannes, exhibits in its entirety the decoration intended for the staircase of the Préfet at the Hôtel de Ville. The drawing for the ceiling was shown last year: it represents Victor Hugo offering his lyre to the City of Paris, as I last year described in detail. I have already pointed out how dangerous seemed to be this practice of exhibiting decorative designs apart from their intended surroundings. This time, in order to obviate this difficulty, which does such injustice to the critic and the painter, the designs have been surrounded with the architectural lines, painted and decorated, which will actually enframe them. The four vault soffits

[1] Mr. Brewer's drawing embodying this suggestion is reproduced as one of our illustrations.

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and the six tympana are indicated and show how the discreetly attenuated coloring of the artist will harmonize with the architecture. Even the drawing, simplified and reduced almost wholly to lines, has a decorative feeling. With M. Puvis de Chavannes it is always necessary to consider the *ensemble* only, and not halt at certain details which exhibit an awkwardness wholly unaccountable in an artist who signed the magnificent drawings which for a year passed have been hung at the Luxembourg. For the vaults, the allegorical figures symbolize: Patriotism, Charity, Artistic Ardor and Intellectual Force. Those for the tympana represent: the Mind, Fancy, Beauty, Intrepidity, Memory and Urbanity. The *ensemble* is in perfect harmony in all that concerns tone, but as this great ceiling decoration is hung on a vertical wall it is impossible to determine the final effect, but I may be allowed to express the fear that these personages will be found lacking in balance, having been placed, seemingly, without due allowance for the perspective effect peculiar to this kind of decoration.

Having thus placed apart by themselves the two most important exhibits, it is now necessary to pass through the galleries, stopping only before those canvases of real value, or those which have excited public remark. For one who tries to present a general idea of the exhibition at the Champ de Mars, and that is all I am doing, the exhibits may be divided into two great camps, as it were: the dark and the light, and it is interesting to note that the critics who used so to applaud the *plein air* and rather "loud" painting of Manet to-day admire and applaud paintings that are sombre, black and charcoally. This is evidently disconcerting to the dear public, accustomed to seek its opinions ready-made in the morning papers, and to await the verdict of the fashionable critic of the day before expressing its own views. Thus, this year much praise is showered on the portrait of the Comte de Montesquiou-Fézensac, by Whistler. It is quite plain that this life-size portrait is no commonplace one; in its lines, in its attitude, it evinces the aristocratic character which unquestionably belonged to its original. This tall personage, in a black coat, has a rather impertinent and disdainful air; but he is none the less lugubrious, lugubrious and funereal. It is not allowable to paint a black coat so absolutely black as this, against a black background, too. When one looks at this portrait, one feels as though one ought to put on mourning one's self. And Mr. Whistler prefixes to the name of his sitter in the catalogue the words "*noir et or*," words which to us are absolutely enigmatical. All his canvases "Brun et Or" (portrait of a woman), "Vert et Violet" (portrait of another woman), "Violet et Argent" (marine effect), pretend to be harmonies of color most difficult to detect and make us suspicious that the artist has more "gall" than skill.

Simplicity does not shine at the Champ de Mars. In especial, it is wanting in the works of M. Frédéric and of M. Adolphe Binet. The former exhibits a horrible nightmare, styled "Everything is dead": it is a seeking after horrors and atrocities pushed to the farthest limits. Religion, Love, Justice, everything is dead, and to prove it, M. Frédéric has covered his canvas with a bloody smear whence emerge here and there, broken limbs, tortured and maimed bodies; it is a heap of murdered bodies soldered together, so to speak, by a stream of blood, and surrounded by flames. At the top of the picture, God, overwhelmed by his own work, or rather, I should say, by the work of M. Frédéric, veils his face and groans.

The "Temptation of St. Anthony," by M. Adolphe Binet, is no more joyous, and it must be admitted that the saint was quite right in turning his eyes away from this spectacle, which the reading of Flaubert has evoked before the artist. Here is a man with his skull cleft in twain, holding the upper half in his clenched hands and drinking out of it. A Cæsar, clad in a cuirass, stretches out his red and bloody hands, while around these two personages naked men and women whirl in a frightful pell-mell. Unfortunately, the artist exhibits much skill in his handling, but what a frightful subject!

Now let us rest our eyes upon the freshness of M. Meunier's "Colporteur," who, as he rests by the roadside, excites the admiration of the peasant girl about to spread her wash on the bleaching-field. It is pleasing and finely studied; indeed, we always find in M. Meunier's work a conscienciousness which is hardly now in fashion, but which one would like to find more of in the work of those who profess to despise this quality.

Evangelical subjects are not wanting and we have plenty of "Good Samaritans" and "Christs": that of M. Dagnan-Bouveret, representing an apparition appearing out of the depths of a sombre background, is very fine. The expression of the face well depicts the state of the Master's soul, full of the bitterness of death. M. Béraud's "Road to the Cross," on the other hand, is far from enjoying the same qualities. Of late years, this artist seems to have set himself the task of modernizing the divine countenance. After having shown us Jesus in a private room of a restaurant on the Boulevard, he this year shows Him to us climbing Calvary, surrounded by a shouting band of workmen, veritable types of the frequenters of the *barrière* and public *réunions*. All this is gross and in wretched taste, but none the less the crowd gathers about this picture far more than around the admirable work of M. Tissot. M. Carolus Duran also exhibits a "Christ at His last hour": against a black cloud, which is advancing out of the sky, the crucifix is detached mid a luminous glow which also bathes the female figures prostrate at its foot. The remainder of the picture is sombre and stormy and allows all interest to centre on the principal personage; it is a poetical sketch, full of feeling and borders on inspiration. Naturally, M. Carolus Duran exhibits several canvases, portraits all, brilliantly treated and one of which, "The Poet and the Mandoline," will always be one of his best; it is clear, living and energetic painting.

Does the palette of M. Daumas furnish clear colors? Unquestionably it does, but in my opinion, his tones are dull rather than luminous: this smacks of artificiality and is brutal. M. Montenard is luminous in the truest sense of the word. But he is a landscapist, it will be said; but what difference does that make? Light is light, and the southern sun has no better interpreter than he. Amongst the "lights," too, must be ranked M. Besnard who seeks odd and complicated effects. This year he shows us a sickly woman, to judge by her complexion, and an eccentric one, to judge by her gown of a yellow that is startlingly yellow. True, we see close at hand, strangely-colored horses, carmine in fact, caracoling over a violet ground beside a very, very green sea. Is this art? Some say it is, others doubt it, and with these I ally myself.

There is but little *genre* painting at the Champ de Mars. M. Jeanniot is a man who paints an anecdote with spirit. His "Conscripts" filing before the Council of Revision, with their meagre and poorly set-up bodies, are amusing and the scene is cleverly painted. M. Roll's life-size peasants are also very truthful. His "Workers of the Soil" is rendered with much feeling and one seems to feel the heart-beats of those humble spectators of the mother suckling her infant as she gazes upon it lovingly.

Amongst the artists who are content to study Nature, and render her simply without taking refuge in obscure and complicated symbolization, there must be mentioned amongst the portrait painters MM. Mathey, Edouard Sain and Gervex; and amongst the landscapists, Damoye, a master, Iwill, whose Venetian views are treated in a rather ideal and decorative manner, but charming withal, and Pokitonow who shows some little landscapes that are adorable.

After the "lights" come the "darks," and it is curious to see the same nature, the same humanity interpreted in so different manners, so far as color goes. M. Aman Jean, a young painter much upheld by a certain school, sees every one under a bistre or yellow color; his portraits are uniform and flat. When one considers how time has used vigorous paintings of relatively recent date, one wonders what will happen to those of M. Aman Jean and to those of M. Alexander, too, whose ash-colored portraits are rendered in the "dark" manner, relieved very imperfectly by a few gleams of dull and artificial light: and yet there is life and expression in these faces.

One of the old believers in light, M. Duez, has been caught by this sombre fashion and has toned down his palette in a regrettable manner. His "Bathing Hour," showing two Parisiennes who have come to gaze on the bathers on the beach, does not altogether escape this criticism, though compensation is in great part made by the former good qualities of the artist.

I think I have now given a general idea of the exhibition so far as painting goes. Sculpture does not fill a very important rôle and it may properly be considered in connection with that shown at the Champs Elysées.

Maurice Brincourt.



AMERICAN INSTITUTE OF ARCHITECTS.

The subjoined circular letter has been addressed to each architect in the country in the hope that each will take the action suggested:—

Office of the Secretary, Providence, R. I., May 21, 1894.

Dear Sir:—

During the last twenty-five years the American Institute of Architects and members of the profession who do not belong to that body, together with many others who are deeply interested, have been trying to bring about a reform in the methods of designing and constructing buildings for the United States Government.

The officials at Washington have met our committees courteously, have assured them of their entire sympathy, and have promised to support this cause. But we stand, practically, where we did a quarter of a century ago, although earnest and persistent efforts have not been wanting.

We are now forced to see, that the path, so patiently pursued, runs in a circle and does not lead to any goal and that there has never been manifested in Washington the sincere support necessary to carry on this reform. We have failed to win our cause through personal, private means and must now go to the Country with the facts.

THE ABUSES TO BE REFORMED.

1. The needless cost of the public buildings.
2. The needless cost of architectural service.

The authority for the figures quoted below is Mr. Glenn Brown's article in the *American Architect* of April 7, 1894, entitled "Government Buildings compared with Private Buildings."

COST OF BUILDINGS.

Mr. Brown's statistics show the actual cost of a large number of Government and private buildings, which he compares with each other, class by class.

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These statistics prove that the United States Government buildings cost 67 per cent more per cubic foot than private ones of similar construction, finish and size.

COST OF ARCHITECTURAL SERVICE.

Private "architectural service" covers the following:
Preliminary sketches, which include competitive drawings.
The final designs of every sort.
The working-drawings, details and specifications.
All necessary reproductions of drawings.
All services of mechanical, sanitary, heating, electrical and constructional engineers, together with the draughtsmanship, details and reports, necessary to carry out their ideas.
All paper, stationery, book-keeping, estimating and rendering of accounts, making of certificates, etc.
All preliminary and final adjustments.

For the above services the regular fee is 5 per cent on the total cost of the building. To this should be added the sum of 1 per cent, estimated on the cost of the building for travelling-expenses, in case there are any, and for clerk-of-the-works, both of which are usually paid for by the owners themselves.

The cost, therefore, of complete private architectural service, including the clerk-of-the-works and travelling-expenses, amounts to 6 per cent.

Mr. Glenn Brown's statistics, taken from the actual cost of a large number of *separate structures*, shows that *the Government expends* for the same architectural service, as listed above, *over nine per cent* (9 per cent)[1].

COMPARISONS.

Cost of architectural service, public buildings.....	9 per cent.
Cost of architectural service, private buildings.....	6 per cent.
Excess of cost of Government over private architectural service.....	50 per cent.

But this last comparison is made as if the Government and private buildings cost the same per cubic foot, which, however, is not the case, as the Government buildings cost, on an average, 67 per cent more than private buildings. The true comparison, therefore, on a basis of the same cost per cubic foot for private and public buildings is:

Architectural service, public buildings.....	15 per cent.
Architectural service, private buildings.....	6 per cent.
Excess of cost of Government over private architectural service.....	150 per cent.

NOTE.

It is stated by Acting Secretary of the Treasury Curtis, in House of Representatives, 53d Congress, 2d Session, Ex. Doc. No. 179, which was recently sent to the speaker of the House of Representatives, that:

"It appears from the schedule of fees customarily charged by architects that the expense of preparing plans, drawings, and specifications and administration under the Act might be greater than at present, but how much cannot be satisfactorily determined until a definite and detailed scheme is prepared for its development."[2]

Does the Acting Secretary mean that the extravagant system now in vogue in the office of the Supervising Architect of the Treasury Department must be retained, and that to the total percentage must be *added* that paid to outside architects, should they be employed to make designs? If so, one of the main purposes of any new legislation, so far as the architects are concerned, should be to cut off this frightful extravagance in the office of the Supervising Architect, in order that the Government may have the work done at the same price that individuals pay, and by means of a service more able, expert and satisfactory.

It is this very matter of enormous expense that we are striking at.

The Government can have its work done as cheaply as any one else, provided a mandatory law be passed, insuring the employment of the expert architects of the country.

THE ARCHITECTURAL RESULTS.

This point needs no argument: — That after spending 50 per cent more for a given building, and 150 per cent more for full professional services than there is need of doing, and after taking from twice to ten times as long to finish the structure, the result is inferior. The Government buildings obtrude themselves upon us; are inferior not only to the *best* contemporary private structures, but to the *average* ones; few, if any, are well planned, and all are more or less offensive in appearance.

We wish to stop this great waste of the people's money, and to prevent the erection of any more structures which shall debase public taste.

Will you undertake your part in this work? A few men only in the profession have, so far, sacrificed their time and given their best efforts for the cause. It is a public duty. It must be carried forward unselfishly and without personal ends.

You wish to know what is to be done?

1. Study this case until you are familiar with it. Procure a copy of the *American Architect* of April 7, 1894, and of House Ex. Doc. 179, and carefully inform yourself.

2. Use every effort within your power to have a mandatory law passed, which shall provide that all Government buildings costing over $25,000 must be thrown open to public competition.

That a jury to arrange the programme and pass upon the plans be selected, consisting of the Supervising Architect of the Treasury Department, a business man to be appointed by the Secretary of the Treasury, and three others to be appointed by some means which will insure efficient and reputable men who are uninfluenced by party politics.

That when a design is premiated, its author shall be made architect in full charge of the work.

Will *you* personally see, or write, to your congressmen and senators, at once, and cause to be written not less than ten (and fifty, if you can) letters from influential men, all addressed to those public officials and strongly favoring this cause? Please *see* the letters written and signed, wherever it is possible to do so without giving offence. Send one copy of each to Mr. Secretary Stone of the Institute, Providence, R. I.; and the other copy to the person to whom it is addressed.

Please call upon each and every newspaper and periodical within your reach and bring all the influence to bear you can, to induce them to strongly favor the passage of such an Act as we desire, and send marked copy of every newspaper and periodical in your territory, mentioning this case favorably, to the Secretary, and one to each of your congressmen and senators. It is especially important that each newspaper shall follow up the work and not allow an issue to be printed without some favorable mention of this matter in its columns.

Will you also request each of those who write letters for you, to sign a petition to Congress, and will you please forward this petition to the Secretary, who will make proper use of it?

Faithful, persistent, urgent effort on the part of all will be necessary in this reformation. Don't say to yourself that another will do better, or more, or that he will attend to any duty within your possible reach. Do it yourself, giving to the Institute and its officers, who are making so great an effort, all the time you possibly can during the next 100 days. Do not intermit your efforts before Congress adjourns.

It will assist the officers of the Institute, if you will promptly acknowledge to the Secretary the receipt of this letter, giving them the benefit of your suggestions regarding further action.

Yours faithfully, ALFRED STONE, *Secretary A. I. A.*

THE letter from the Acting Secretary of the Treasury. . . . in response to House resolution adopted March 16, 1894, relative to plans and specifications for public buildings here follows:

TREASURY DEPARTMENT, OFFICE OF THE SECRETARY: —
WASHINGTON, D. C., March 31, 1894.

DEAR SIR: —

In response to a resolution adopted by the House of Representatives, March 16, 1894, requesting the Secretary of the Treasury to inform the House of Representatives what measures, if any, had been taken by him under the Act entitled "An Act authorizing the Secretary of the Treasury to obtain plans and specifications for public buildings, etc.," approved February 20, 1893, and to inform the House what, if any, further legislation is in his opinion necessary to carry out the provisions of the said law, I have the honor to make the following statement:

Early in March, 1893, the subject-matter of the Act in question was brought to the attention of the Secretary of the Treasury by several members of the American Institute of Architects, and at their suggestion a conference was held on the 22d of March, 1893, at which the provisions of the Act were discussed, and some of the difficulties in the way of putting it into practical operation mentioned. Subsequent thereto, certain correspondence took place between the officers of the American Institute of Architects and the Secretary of the Treasury, and also between them and the Supervising Architect, individually.

Early in January, 1894, a committee of the American Institute of Architects submitted a written protest against the sketch-plans of the United States public building at Buffalo, N. Y., which had then been prepared by the Supervising Architect and approved by the Secretary of the Treasury, and two conferences in regard thereto, one on January 10 and the other on February 6 of this year, were held by the committee with the Assistant Secretary of the Treasury, having general direction and supervision of all matters relating to the public business assigned to the Supervising Architect, the Secretary being unable to meet them owing to other engagements. These conferences, and the tenor of the correspondence arising therefrom, emphasized the inadequacy of the provisions of the Act to accomplish the desired object, and it was then decided that the designs for the Buffalo building, which had been temporarily held in abeyance, be proceeded with, but that this should not prevent further negotiations in the endeavor to effect the intention of Congress in making the enactment. . . .

The following suggestions were made to the architects' committee:

That there was a conflict between the provisions of the present Act and the provisions of certain other statutes regarding public buildings; that it was necessary to prepare a comprehensive scheme under which

[1] "Civis" (Adolf Cluss, who from service in the office of the Supervising Architect knows whereof he affirms) in a paper on this subject printed in 1869, says that the architectural service rendered cost the Government more than eleven and eight-tenths per cent.

[2] See the following document in full.

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a competition could be arranged and a method provided for selecting a jury of award to pass upon the designs received in such competition; that the relations of the successful competitor with the Secretary of the Treasury and with the Supervising Architect's Office should be clearly established and defined by contract; that the required change in the method of preparing the plans, drawings, and specifications would necessitate a reorganization of the office of the Supervising Architect, a reduction in its force, the rearrangement of the different divisions, and the work to be performed therein; that they should examine the workings and details of the office, in order to make intelligent criticisms and suggestions thereon.

The Act of March 3, 1875 (Sundry Civil Act, section providing for payments, contracts, etc., for public buildings), was neither repealed nor amended, and this requires that —

No money shall be expended upon any public building on which work has not yet been actually begun until after drawings and specifications, together with detailed estimates of the cost thereof, shall have been made by the Supervising Architect of the Treasury Department, and said plans and estimates shall have been approved by the Secretary of the Treasury, the Secretary of the Interior and the Postmaster-General. . . .

This provision conflicts with the evident purpose of Congress expressed in the present Act.

The Supervising Architect of the Treasury is the proper Government official to prepare a scheme for the competition contemplated in the Act in all its various details. He has the necessary experience, and acquaintance with his professional associates, and can give the time and attention required therefor. A proviso that such scheme should be approved by the Secretary of the Treasury would seem to insure the satisfaction of the public.

In the selection of a satisfactory design for a public building, both practical and architectural questions are presented and any jury of award to pass upon the plans should consist, not only of architects, but also of business men or Government officials who are familiar with the practical uses and necessities of the public building under consideration at the time. A commission or jury of award consisting of five members, three of whom should be architects of recognized professional standing and experience, and two business men or Government officials to be appointed by the Secretary of the Treasury, and paid for their services while actually engaged in their work, is suggested.

Under the present Act the successful competing architect will have the preparation of the plans, drawings, and specifications, while the preparation of the proposals, the award of contracts, and the payment of all moneys are delegated to the Supervising Architect, and the latter is to perform all duties that now pertain to his office, except the preparation of drawings and specifications for the buildings and the local supervision of construction. This language fails to clearly define the duties of either. It would, therefore, seem necessary that the architect should have entire control of all the details pertaining to the construction of the building in the manner in which architects customarily control them, and the duties of the Supervising Architect be limited to a general supervision, to protect the interests of the Government during the course of construction, or that the competition should be limited to designs to be carried out by the Supervising Architect. In any event, the Secretary of the Treasury should be authorized to use his discretion as to this, and directed to contract with the architect, and obtain an agreement defining strictly his duties and rights in the premises, the amount of his fees, the method to be followed during the course of construction, and to make any other provisions deemed advisable.

The office of the Supervising Architect is engaged with other work besides the construction of public buildings. It arranges for and supervises the repairs and preservation of the public buildings in the country, finished and occupied, numbering two hundred and seventy-three, the assignment of rooms therein to various officials as the needs of the public service require, the keeping a large number of records regarding the Government buildings, the proceedings regarding the obtaining of sites, the condition of the various appropriations and expenditures thereunder, and many other details. It would be necessary to retain a considerable portion of the present force of the Supervising Architect to carry out this work effectually.

It appears from the schedule of fees customarily charged by architects that the expense of preparing plans, drawings and specifications and administration under the Act might be greater than at present, but how much cannot be satisfactorily determined until a definite and detailed scheme is prepared for its development.

I am of the opinion, then, that in order to carry out the intention of Congress in enacting this law, it will be necessary to amend the Act by substituting the following:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Treasury be, and he is hereby, authorized, in his discretion, to obtain competitive designs or complete plans, detailed drawings, and specifications for the erection of the public buildings of the United States, authorized by Congress to be erected under his supervision and direction. The Supervising Architect of the Treasury Department shall prepare a scheme for free or open competition among the architects of the United States therefor, such scheme to be approved by the Secretary of the Treasury: That the Secretary of the Treasury shall nominate and appoint a Commission or Commissions, each consisting of five citizens of the United States, three of whom shall be architects of recognized professional standing and experience, and two of whom shall be men of business or Government Officials who are familiar with the uses and necessities of the public building under consideration at the time, to select the best design or complete plans from those submitted in accordance with the scheme of competition hereinbefore provided. The members of the said Commissions shall be paid their actual travelling expenses and subsistence while actually engaged in the performance of their official duties.

The expenses of the Commission and the fees for the services of the architect successful in said competition shall be paid from the appropriation for the building respectively passed upon or designed. In case the complete plans, detailed drawings, and specifications are furnished by competition, as herein provided, the Supervising Architect of the Treasury Department shall be the representative of the Government to inspect the erection and completion of the building, the receipt of proposals, award of contracts therefor and the disbursement of moneys thereunder. In case designs only are supplied by competition, the Supervising Architect shall perform the duties now required of him by law, in the usual manner, excepting the preparations of such designs. That in the discretion of the Secretary of the Treasury, the architect selected as herein provided to furnish complete plans, drawings, and specifications, shall have the entire direction and control of the construction of said building, and the direction and control of the local superintendent of construction, and the Secretary of the Treasury is hereby authorized in all cases to make a contract with said architect for his services, providing for such erection and control, fixing his duties and responsibilities during the construction of the said building, and making proper provision for modification or change in the plans and specifications during the progress of the work, and for additions thereto; also determining the amount of his fees and charges, and including such other provisions in the contract as may, in his discretion, appear advisable to protect the interests of the Government. Any or all of the designs, or plans, detailed drawings and specifications presented in the competition herein provided may be rejected by the Commission, and in case the competition fails for any cause, or it is impracticable to obtain designs or plans, detailed drawings, and specifications by competition, the Secretary of the Treasury shall direct the Supervising Architect to prepare plans, drawings and specifications and supervise the construction of the building in the usual manner according to law.

All Acts, or parts of Acts, inconsistent or in conflict with this Act are hereby repealed.

Respectfully yours, W. E. Curtis, *Acting Secretary.*

The Speaker of the House of Representatives.

SKETCH CLUB OF NEW YORK.

The last regular monthly meeting of the Club before the summer vacation was held at the club-rooms Saturday evening. Forty-four members and four guests were present. Mr. Russel Sturgis and Mr. Walter Cook were guests of the Club. President E. A. Josselyn occupied the chair. Mr. Sturgis delivered a lecture on Greek Architecture and its adaptability to modern work. Mr. Cook criticised the drawings submitted last month for a country railroad station; everybody was well pleased with the result.

The Club then plunged into a heated discussion on the advisability of admitting ladies to full membership. The whole matter was finally referred to the Executive Committee.

The meeting adjourned at 11 P. M., when the members were treated to a performance of legerdemain by Professor L. Krieger, and music by Club talent. H. C. Pittman, *Secretary.*

PETROLEUM-BRICK FUEL.

The following is Maestracci's method of manufacturing petroleum bricks for fuel:

Mix one litre of petroleum, 150 grams triturated soap, 10 per cent of resin, and 333 grammes of caustic soda. Heat this mixture, being careful to stir it well meantime, until solidification commences — say about forty minutes. If the mixture should tend to boil over, pour in a few more drops of the soda, and continue to stir until solidification has sufficiently progressed; then pour the semi-fluid material into moulds to form the bricks, and place these in a hot room or drying place for ten or fifteen minutes; then remove them and let them cool. In a few hours they can be used as fuel.

To the three elements which constitute the mixture Mr. Maestracci recommends the addition of 20 per cent of sawdust and 20 per cent of clay or sand, which makes the bricks more solid and less expensive. Trials of these bricks as fuel have been made at Marseilles on several tugs, and it has been found that, weight for weight, they develop three times as much heat as the ordinary coal brick, and leave no ashes.

It is expected, with some slight changes in the furnaces, to arrive at still more perfect results, not only in the increased heat, but in the entire suppression of smoke, and on the most economical basis, one kilogramme of the solidified material being equal to four kilogrammes of coal. These experiments seem to be very interesting, and it is quite easy to understand that there is a double advantage in using such fuel on steamers, as they economize in both space and cost.

C. W. Chancellor, *U. S. Consul at Havre.*

AUSTRALIAN WOODS FOR STREET-PAVING.

Melbourne, January 12, 1894.

At the present time, when this country is recovering from the recent financial cyclone, and when the business outlook is daily growing more promising, it is not inappropriate to consider by what means the commerce between the United States and the Australian colonies can be increased to mutual advantage.

It has occurred to me that a large and profitable business can be done between the two countries by the shipping to the United States of wood blocks for street paving. The advantages to be derived are manifold.

Wood pavements are admittedly the best in the world, and of late years they have only been abandoned in the United States owing to the fact that no wood of native growth could be found that would stand the wear and tear of the heavy traffic in our large cities.

In this country one is compelled to notice and give the palm to the street pavements made from blocks of red and blue gum, a wood grown in this country, which has proved to be equal to all requirements.

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I have noticed in this city and in Sydney, where strips of the wooden pavements have been joined to a stone pavement, and where both have been subjected to the heaviest wear, that the wooden pavement has worn even better than the stone, and, where the two pavements join, the edges of the wood blocks are not even chipped or worn.

It is a pity that our country, which is so far ahead of other lands in many respects, should be so far behind in this matter of street-paving.

Can we not adopt the Australian wood blocks to advantage? If a fair trial could be given by some of our cities, I am sure that it would result in the adoption of Australian timber for street-paving in the United States and thus open up a new industry between the two countries.

Perhaps the very best timber obtainable for this purpose is the Tasmanian blue gum. This has worn here for six or eight years. In all that time no repairs have had to be made, and the pavements are as good to-day as when laid.

The Tasmanian Government is interested in the matter, and have taken active steps to place samples before our contractors and municipal authorities.

An American exporting and importing firm doing business here, with a branch in New York City, recently visited Hobart, the capital of Tasmania, and laid the matter before the Premier. They were most courteously received, and at their suggestion the Premier caused to be shipped to them, in New York, samples of these blocks, which can now be seen at the office of Messrs. Trowbridge & Terry, 531 Broadway.

While these hard woods are plentiful here, it must be remembered that the cost of freight, etc., would bring them to New York at a price probably no lower than cedar blocks can be obtained at home; but consideration must be given to their durability and vast superiority.

It is not unlikely that in view of opening up this trade with the colonies, and at the same time benefiting our own land, arrangements might be made to admit these blocks free of duty.

The demand at home will be endless and the supply here inexhaustible, and the benefits resulting from the adoption of these blocks apparent. For instance, all sailing vessels coming to this port from the United States are, in nearly all cases, obliged to go to other ports seeking return cargoes. Should the wood blocks be accepted and used in the United States, these vessels could all get return freights here, and thus the trade between the two countries would be profitably increased.

DANIEL W. MARATTA, *U. S. Consul-General.*

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

OFFICE BUILDING AT JUNCTION OF CALIFORNIA, DRUMM AND MARKET STREETS, SAN FRANCISCO, CAL. MESSRS. COXHEAD & COXHEAD, ARCHITECTS, SAN FRANCISCO, CAL.

[Gelatine Print, issued with the International and Imperial Editions only.]

THIS building has lately been completed for the Luning Estate. The cost of the building is about $100,000.

FIRST BAPTIST CHURCH, BRIDGEPORT, CONN; MR. J. W. NORTHROP, ARCHITECT, BRIDGEPORT, CONN.

THE church is built on a peculiar site, there being quite a steep incline in the side street, about 15 ft. from front to rear. This allows of an extra story well above ground in the rear part of the building, which has been utilized to good advantage. The building is of light red sandstone — very hard and durable. The interior is trimmed in oak. Cost, including furniture, organ, etc., $75,000.

DESIGN FOR AN ORGAN BY MR. H. W. BREWER.

SEE article elsewhere in this issue.

ORGAN IN THE CHURCH OF ST. JOHN THE BAPTIST, GOUDA, HOLLAND.

CHOIR ORGAN, ST. PAUL'S CATHEDRAL, LONDON, ENG.

MAIN BUILDING, PYTHIAN UNIVERSITY, FOR THE ORDER UNIVERSAL, GALLATIN, TENN. MR. J. G. ZWICKER, ARCHITECT, NASHVILLE, TENN.

[Additional Illustrations in the International Edition.]

PORTICO OF ANNEX OF THE ART BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. CHARLES B. ATWOOD, ARCHITECT.

[Gelatine Print.]

SOUTHWESTERN CONNECTING PAVILION BETWEEN MAIN ART BUILDING AND WESTERN ANNEX, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. CHARLES B. ATWOOD, ARCHITECT.

[Gelatine Print.]

THE ROYAL COLLEGE OF MUSIC, SOUTH KENSINGTON, LONDON, ENG. SIR A. W. BLOMFIELD, ARCHITECT.

THE new building of the Royal College of Music, was opened by H. R. H. the Prince of Wales, the president, in the name of her Majesty, the Queen, on Wednesday, May 2. It stands almost midway between the Albert Hall on the north and the Imperial Institute on the south, on a broad road running from Prince's Gate to Queen's Gate, and called the Prince Consort Road. The college is built of red brick, with bands and dressings of Weldon stone, and the roofs are covered with green slate. The style is Renaissance, freely treated. The cost of the building has been defrayed by a sum of 45,000*l.* munificently presented to the Prince of Wales for the purpose by Mr. Samson Fox, M. Inst. C. E., of Leeds, in 1891. The decorations of the entrance hall have been carried out at Mr. Fox's cost by a further donation of 1,000*l.*

The college has been erected on a plot of ground granted to the college at a nominal rent by the Royal Commissioners of 1851. It is divided into two wings, one for the male and the other for the female pupils. These have separate entrances, stair-cases and lifts, but are connected on each floor except the top by a corridor running from end to end of the building. The main entrance for the public is in the centre, leading into an entrance hall. Immediately in front of a visitor, on entering, is the general office for inquiries, etc.; on the right are the offices and private rooms of the director and registrar, and on the left, council and committee rooms, waiting-rooms, library, etc. In the sub-basement are the kitchen, the dining-rooms for professors, pupils and servants, and offices; on the basement, first, second, and third floors are the requisite number of class-rooms of varying sizes, and in the upper part of the towers, which form a conspicuous feature at each end of the building, are placed the organ-rooms. The building occupies the portion of the ground immediately abutting on the Prince Consort Road, and space is left in the rear for the erection of a theatre and concert-room, as well as for other additions as the number of pupils increases. Owing to the fact that the ground falls rapidly away from the front, the building has a basement and sub-basement below the ground floor, both entirely above ground on the south front and at the sides. The theatre already mentioned will, it is hoped, be erected at no distant date. It will be planned to serve also for a lecture-room and for orchestral concerts, and will be placed immediately at the back of the central offices on the spot now occupied by the temporary hall, with ample means of easy and direct access and exit by the front entrances. Underneath the theatre, which will be entered on the level of the ground floor, will be large rehearsal-rooms, dressing-rooms, etc. Immediately below the roof is a noble room running nearly the whole length of the building, which it is hoped to occupy shortly with a collection of musical objects. In a room immediately behind the temporary hall is the very valuable and unique Donaldson Museum of historical musical instruments. The statues of the Prince and Princess of Wales in the entrance hall, and the bust of Mr. Fox, were executed by the late Prince Victor of Hohenlohe. The bust of Mr. Fox was executed for the council of the college. In the council-room is a marble bust of the late Duke of Clarence, executed by Mr. J. S. Webber.

THE MARKET PLACE, SAFFRON WALDEN, ENG. MR. E. BURGESS, ARCHITECT.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

"THE BEST TWENTY BOOKS."

MINNEAPOLIS, MINN., May 25, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs,— Will you kindly publish the names of the "best twenty books for an architect's library" which appeared in your paper early in the year 1886, and oblige,

Yours very truly, WILLIAM M. KENYON.

[THE voting produced the following result: 1. Fergusson's "*History of Architecture in all Countries*"; 2. Gwilt's "*Encyclopædia of Architecture*"; 3. The *American Architect*; 4. Viollet-le-Duc's "*Dictionnaire Raisonné de l'Architecture Francaise*"; 5. Smith's "*Notes on Building Construction*"; 6. Trautwine's "*Civil Engineer's Pocket-book*"; 7. Clark's "*Building Superintendence*"; 8. Viollet-le-Duc's "*Discourses on Architecture*"; 9. Jones's "*Grammar of Ornament*"; 10. Rosengarten's "*Hand-book of Architectural Styles*"; 11. Kidder's "*Architect's and Builder's Pocket-book*"; 12. Webster's "*Unabridged Dictionary*"; 13. Ruskin's "*Stones of Venice*"; 14. Gillmore's "*Treatise on Limes, Hydraulic Cements and Mortars*"; 15. Ware's "*Modern Perspective*";

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16. Baldwin's "*Steam-heating for Buildings*"; 17. *The Builder*; 18. Haswell's "*Engineer's and Mechanic's Pocket-book*"; 19. Billing's "*Ventilation and Heating*"; 20. Ruskin's "*Seven Lamps of Architecture*"; 21. Parker's "*Concise Glossary of Architecture.*" — Eds. American Architect.]

EXHIBITIONS

Boston, Mass. — *Several hundred Specimens of Textile Designs of all countries, from the second century to the present time, from the collection given by Denman W. Ross; also the Shimasu collection of Japanese Art:* at the Museum of Fine Arts.

Cincinnati, O. — *Exhibition of the Cincinnati Art Club:* at the Art Museum, May 17 to June 30.

New York, N. Y. — *Twenty-sixth Annual Spring Exhibition:* at the Metropolitan Museum of Art, opened May 8.

Group Exhibition by American Painters — William M. Chase, J. Alden Weir, Childe Hassam and others: at the Galleries of the American Fine Arts Society, 215 West 57th Street.

NOTES AND CLIPPINGS

Judgment against Prince Sciarra for exporting Works of Art. — The suit against Prince Sciarra, accused of breaking an old law by selling certain works of art and allowing them to go out of Italy, which has been pending for the last two years in the Roman courts, has been decided, subject to an appeal in the Court of Last Instance, against him; and he has been ordered to restore the pictures, or, in default, to pay 500,000 lire, the additional penalty of imprisonment, prescribed by the law, being cancelled by amnesty. The judgment was obtained under an old edict, dating from the last century, which, pending the enactment of a law by the Italian Government, remains in force in the former States of the Church. Under this edict, the gallery was declared a trust, to be held for the enjoyment of the people of Rome, this being the condition on which the gallery was bequeathed to the family of Sciarra by its founder. There has been no law enacted on this subject by the present Italian Government. Professor Villari, when Minister of Public Instruction, introduced a law, which would have regulated the traffic in works of ancient art, but his efforts came to nothing. One law prevails in Naples, another in the ex-Pontifical dominions, another in Tuscany, and others still in the kingdom of Sardinia and in the former Austrian provinces. The *Fide-commiessi*, or trusts for the enjoyment of the public, exist only in the States of the Church, and the prohibition against selling applies only to them. The principal pictures covered by the judgment against Prince Sciarra are the "Violinist" of Raphael, the "Modesty and Vanity" attributed to Leonardo, but really by Luini, and a portrait by Titian. They are supposed to be now in Paris. — *N. Y. Evening Post.*

The Manchester Ship-canal. — It seems plain that the great Manchester Chip-canal is going to be a source of great expense and no small danger for some time to come. At a recent meeting of the Liverpool Chamber of Commerce, one of the members said that he had recently visited the canal, and found the traffic in a most lamentable state. The condition of the bank was very serious indeed. With a large traffic and a heavy wash, the banks would go away. Even now they were being eaten away, and must cause enormous expenditure in the near future in the way of dredging. Then the so-called water from Latchford to Manchester was in such a dreadfully malodorous condition that it was almost impossible to exist there, and many people became sick. Another member said that the bad smell would not prevent shipowners from sending their ships to Manchester, if they could make money by it; but those who had tried Manchester had lost heavily, and were dropping off. This testimony, of course, comes from a prejudiced source, but not long ago a Manchester newspaper spoke of the new docks as "huge settling tanks for sewage, chemical and manufacturing waste, and filth of every imaginable description, poured in from an industrial area unequalled anywhere for extent." A Manchester expert, who has compared the sewage of London and Paris, to the prejudice of the latter, finds the Manchester dock water worse than either. The mud deposited by the pent-up liquid, he says, is a vast decomposing mass, that at no high temperature, and after a good deal of rain, sends up gaseous bubbles to every square inch of surface. To remedy these evils a vast and costly system of sewage works is contemplated. — *N. Y. Evening Post.*

The Architect and one Layman, at least. — Quite apropos of nothing at all, the New York *Commercial Advertiser* publishes the following paragraph, which shows that one more layman has acquired an inkling as to what an architect's work really is: "The amount of detail work necessary in an architect's office is simply stunning, and the five-per cent fee of the profession is really insignificant as a compensation for the arduous services exacted. Besides the large contracts, the architect has to attend to numberless petty contracts for every building. In these days of fierce competition the contractor gives as little as possible for the money he receives, and the owner gets as much as he can. The architect's position as a mediator between the conflicting interests is not an enviable one. Every day when building is lively he is called upon to decide questions of law, many of which would puzzle the average lawyer, and he is generally able to do it. Between ignorance and selfishness on the part of clients and contractors, the life of an architect is so harried that it is a wonder that the average duration of life of this valuable class of citizens is not shorter than it is."

Telephones in Old Egypt. — It is reported that an English officer, named Harrington, has discovered in India a working telephone between the two temples of Pauj, about a mile apart. The system is said to have been in operation at Pauj for over 2,000 years. In this connection we may observe that Egyptologists have found unmistakable evidence of wire communications between some of the temples of the earlier Egyptian dynasties; but whether these served a telegraphic, telephonic or other purpose is not stated. — *St. Louis Post-Despatch.*

A Horse-shoe on a Palace. — Just outside the fourth window of the first story of Empress Frederick's palace, at Berlin, there is a large horse-shoe cemented into the wall, which possesses a curious history and whose presence there has given rise to all kinds of strange anecdotes and legends. The true story is as follows: The palace was formerly inhabited by King Frederick William III, of Prussia. One day his son Charles, who had but recently been married to one of the lovely Saxe-Weimar Princesses, was invited to dine with him. Finding that he was very late, and knowing the strictness of his father on the score of punctuality, he directed his coachman to drive as fast as he could and the carriage positively raced up the incline to the portal. Suddenly, one of the big Mecklenburg horses lost his shoe, and the latter, flying up into the air, dashed through the first-story window and fell upon the dinner table right in front of the old King, who, declining to wait any longer for the Prince and Princess, had taken his seat at table. It just grazed his royal nose, and he was so much impressed by his preservation from injury, that he gave orders that the shoe should be cemented into the wall just outside the window through which it had come. — *Marquise de Fontenoy in the Philadelphia Press.*

The Solomonic Candlestick. — Another thing not found yet, but much searched for. It is the seven-armed, so-called Solomonic, candlestick which, after the conquest of Jerusalem by Titus, in the year 70, came with other Temple utensils to Rome. In a learned society at Berlin the much-forgotten fact was pointed out that Procopius, the Secretary of Belisarius, in his history of the war against the Vandals, gives an interesting account of these Jewish utensils. When Rome was sacked by the Vandals they came into the possession of their King Geiserich, and thus into the royal palace at Carthage. Belisarius, who vanquished the Vandal King Gelimer, brought them in 534 to Byzantium. A Jew, who saw the things in the triumphal procession, pointed out to a nobleman of the Imperial Court that these treasures were calculated to bring misfortune upon their unlawful possessor, for Rome had fallen on account of them into the hands of the Vandals, and now, for the same reason, Carthage had been taken by the Romans. Thereupon, the Emperor Justinian at once had the utensils conveyed into the sanctuary of the Christians at Jerusalem. At this point the story stops. But people are still puzzling their heads about the whereabouts of the seven-armed candlestick. Who knows whether it may not turn up some day? — *Cincinnati Commercial-Gazette.*

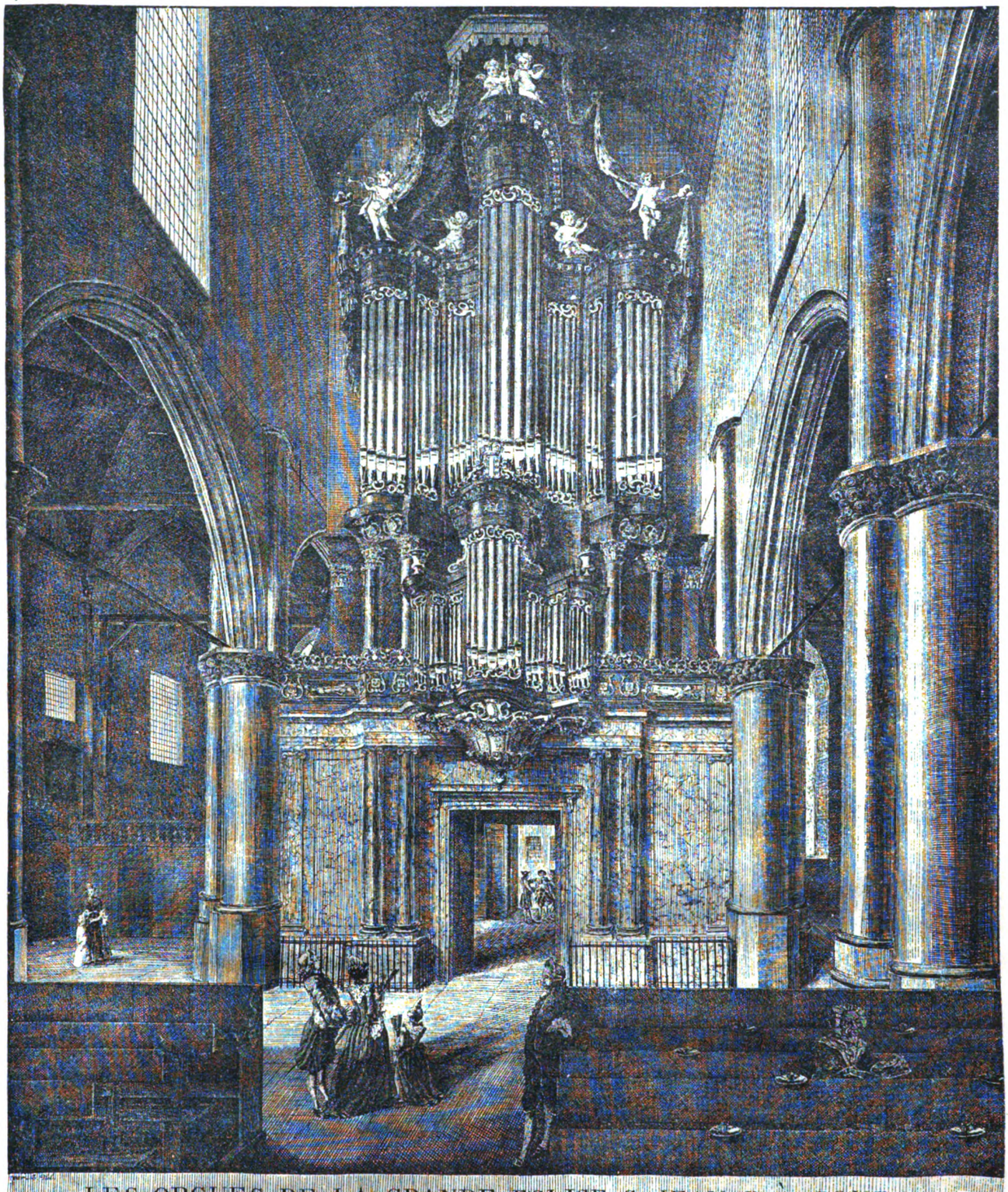
Ceiling-paintings Part of Realty. — On the ceilings of the private dwelling, 1045 Fifth Avenue, are five paintings on canvas, the work of a French artist, Dupanais, representing, respectively, "Science and Art," "Music," "Spring," "Autumn" and "Winter." The question of the removal of these paintings or retaining them on the ceilings has been the subject of a hotly-contested litigation before Judge McAdam, in the Special Term of the Superior Court. Israel Cahn and Mrs. Mary S. Hewey were the contestants, the former as the holder of a second mortgage for $20,000 on the house and lot and the latter as the mortgageor. Mrs. Hewey, preliminary to moving out of the house, advertised all the furniture and belongings for sale at public auction. A special day was set apart for the sale of the paintings on the ceilings. Mr. Cahn protested against the sale, claiming that the removal of the paintings would so change the interior of the house as to jeopardize his mortgage security. It was contended on the other hand that the paintings were a part of the household effects. A temporary injunction was granted, prohibiting the sale, and Judge McAdam, after hearing both sides and an examination of the legal points, decided lately that the paintings must remain where they are — in other words, that they form a part of the realty and cannot be classed in the catalogue of personalty. — *N. Y. Times.*

The Righteousness of the Professional Fee. — In the following anecdote, the St. Louis *Globe-Democrat* gives a most ingenious *argumentum ad hominem* in explanation of the right by which a professional man makes an apparently high charge for a comparatively slight effort on his part: A well-known lawyer of Richmond was consulted on one occasion by a very wealthy, close-fisted old gentleman, who asked him his opinion on a point of law. Mr. Jones listened to the statement, and then wrote an opinion on a single sheet of legal cap, which he handed over to his wealthy friend. The latter, after glancing through it, put his hand in his pocket, and, bringing out two or three bills of small denomination, asked the usual question. When the lawyer said his charge was $500 the seeker after legal lore made use of some remarks unfit for publication, and reminded his friend that the whole business had not occupied more than fifteen minutes. The lawyer took off his spectacles, wiped them deliberately, and pointing to his immense library of books, asked his client whether he would like to read them all carefully for $500. The client said, of course, not. "Well, then," retorted the lawyer, "what are you grumbling about? I had to read every one of those books once, and a good many of them twice, before I was able to give you the opinion you wanted, and it is none of your business whether I read them before you came in or after. If I made you wait while I read them you would have thought my fee well-earned, but I should have caused you to lose time worth a great deal more than $500 to you while I was doing it."

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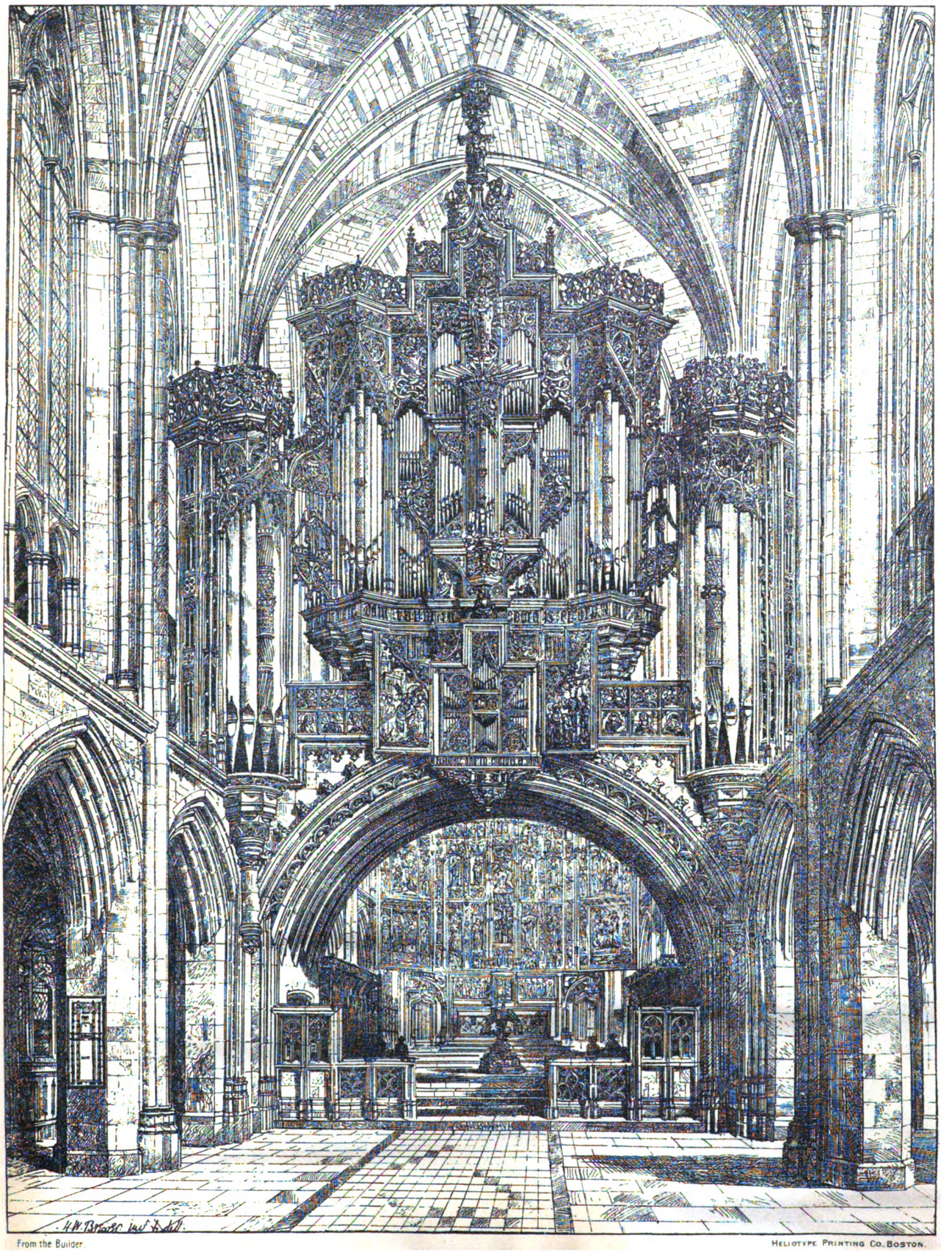
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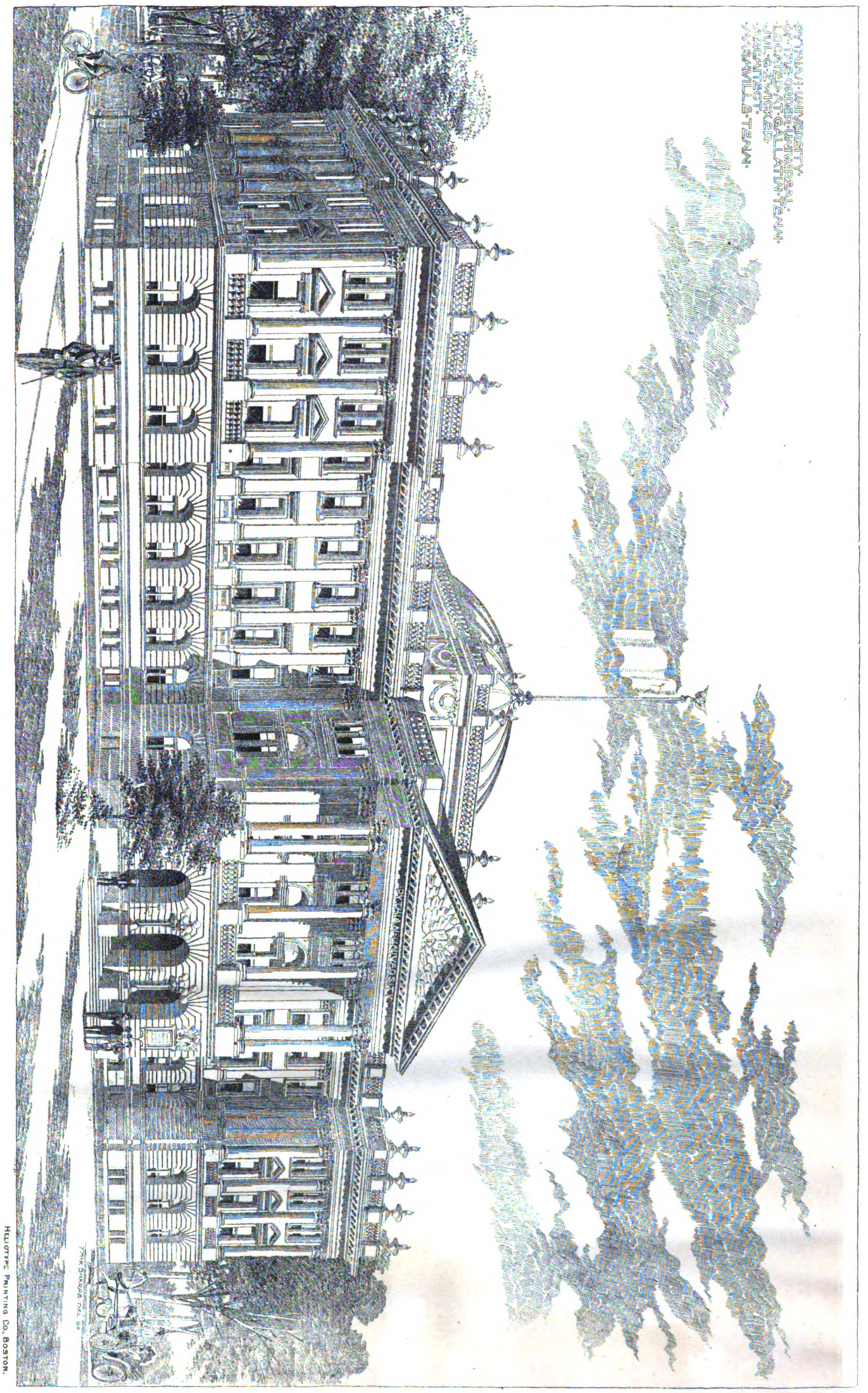
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To Illustrate Paper read by Mr. H. W. Brewer.

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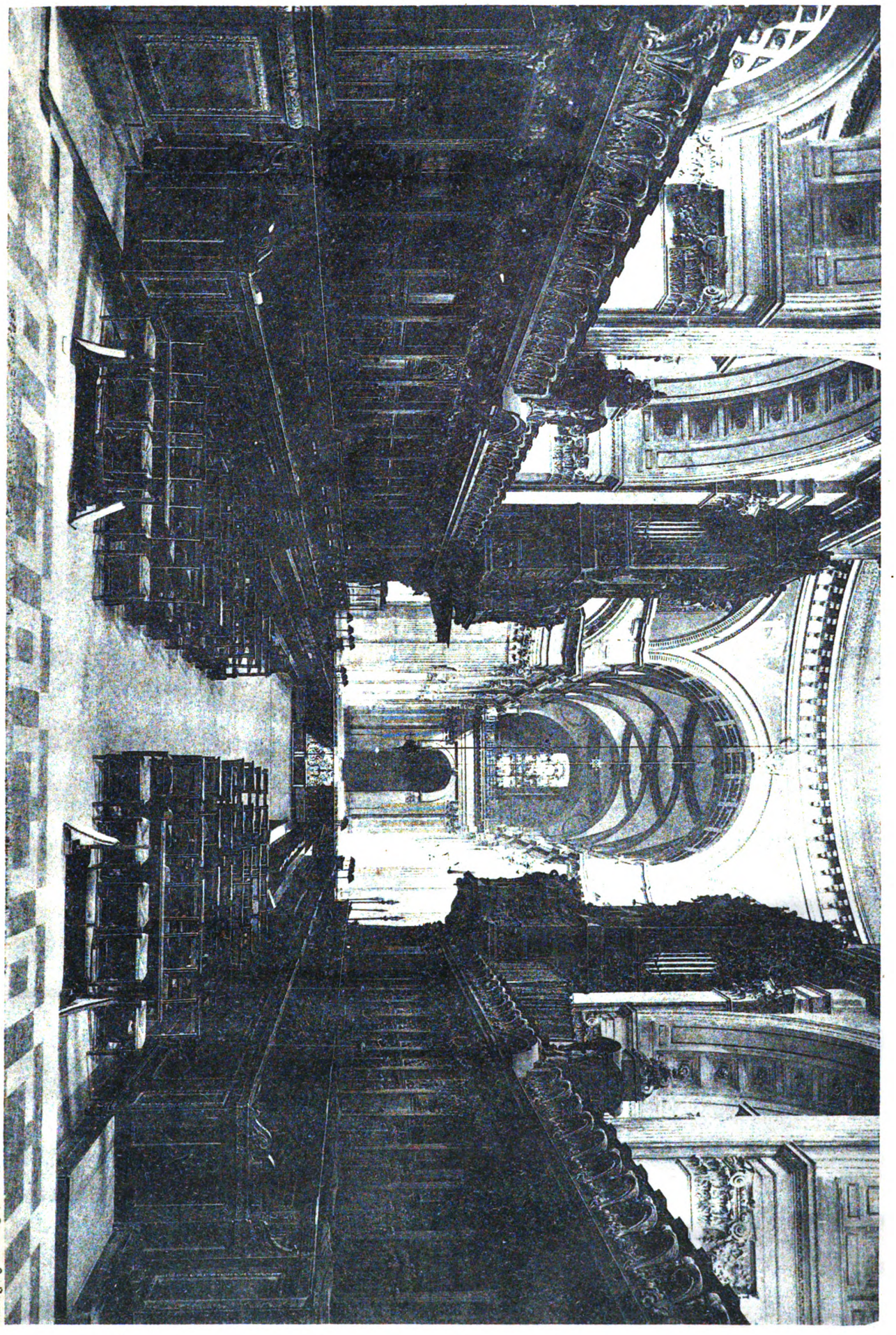


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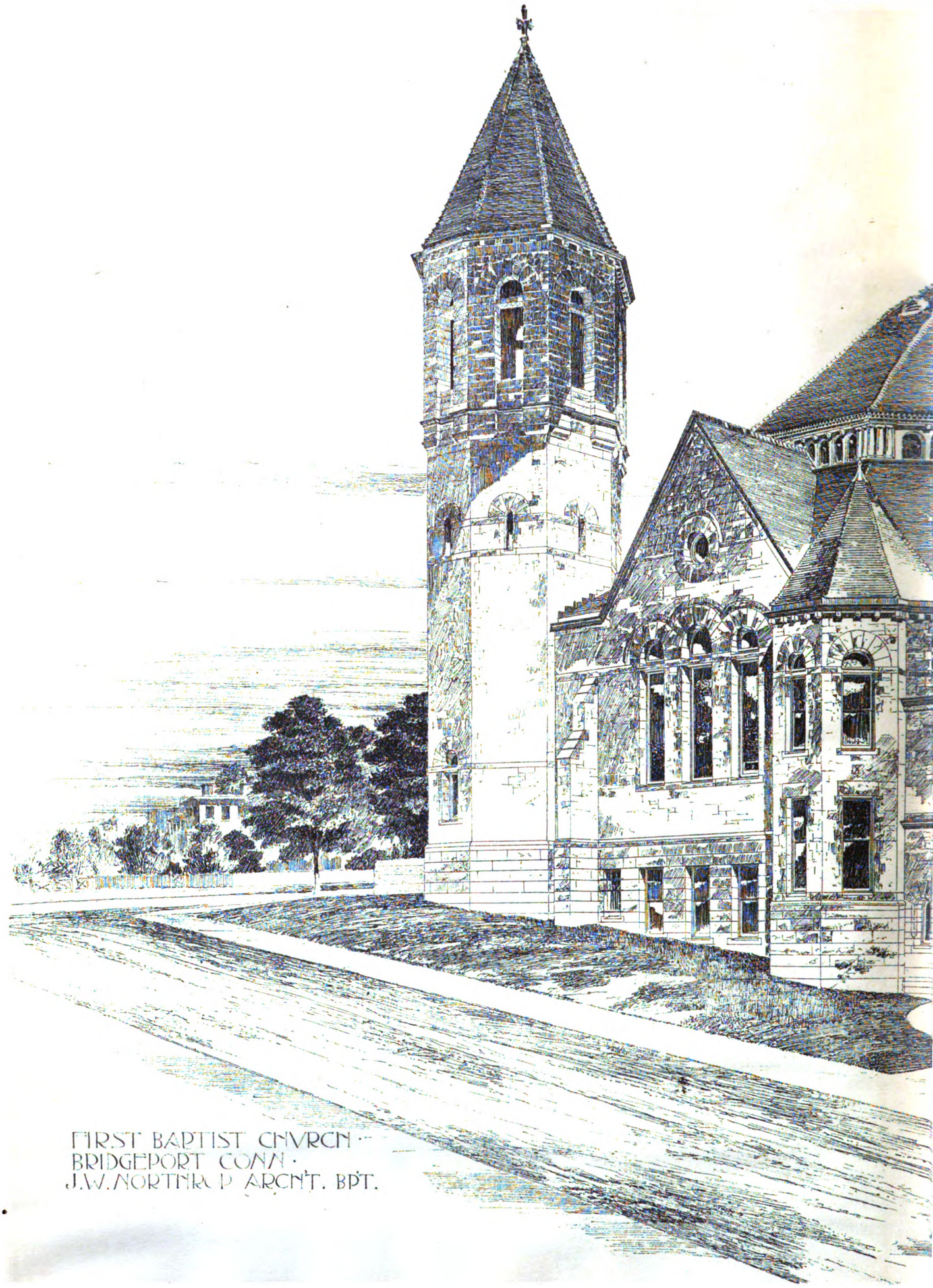
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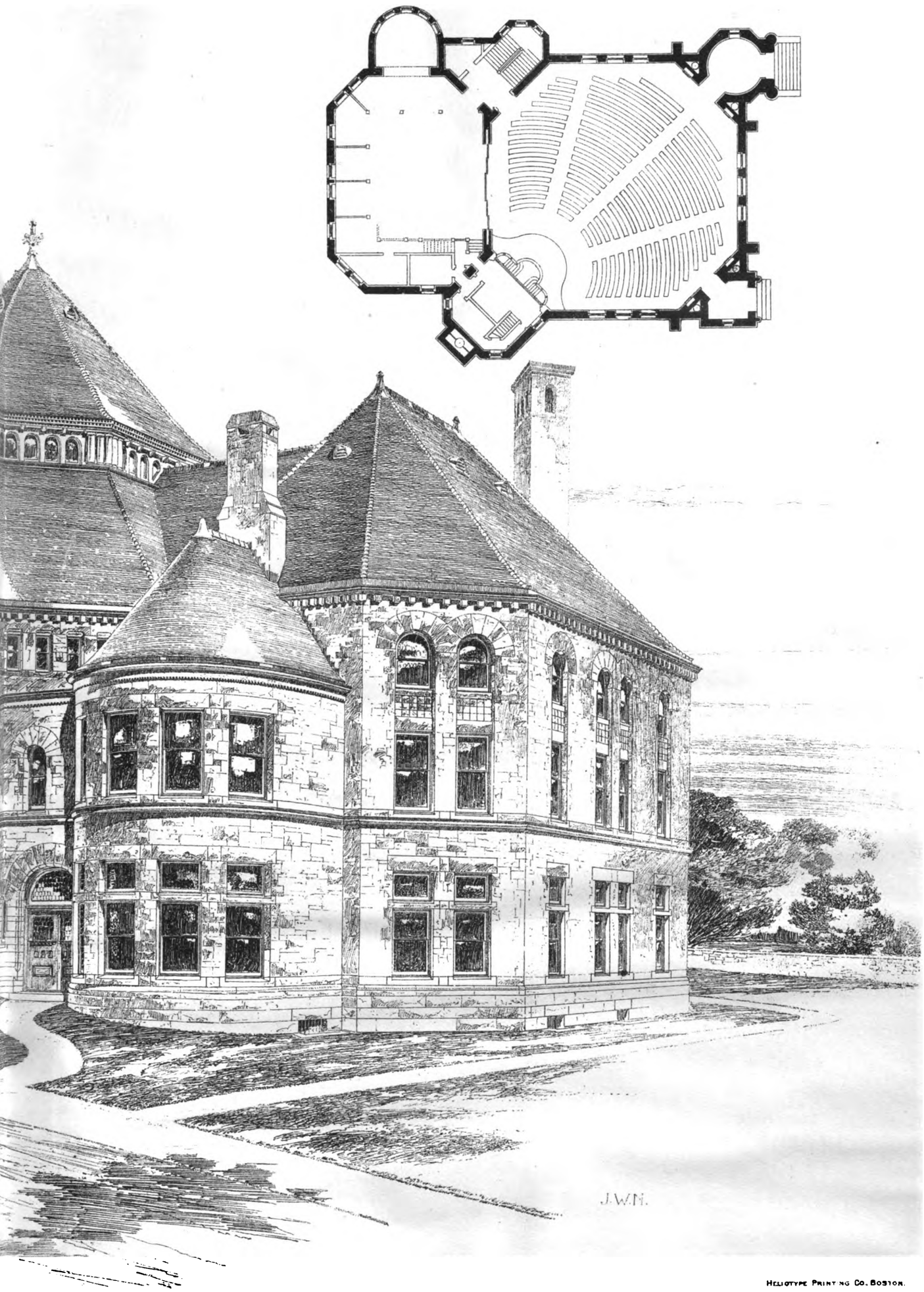
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THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XLIV.

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No. 964

Entered at the Post-Office at Boston as second-class matter.

JUNE 16, 1894.

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WE print in another place a series of rules defining the responsibility of architects and engineers toward their employers, according to the civil law, issued by the Association of German Architects and Engineers, for the information of its members. The present translation was, by the courtesy of the officers of the Association, made for presentation at the Congress of Architects, held last year in Chicago, but the sudden death of Herr Kümmel, to whom the matter had been entrusted, prevented this; and the translation, which was found among the papers of the deceased, has only just been forwarded to the President of the Institute. It is to be understood that these rules do not, by any means, form a code which has been adopted by the German architects and engineers, or which it would be desirable for any body of architects or engineers to adopt: — they are simply intended to give, in a condensed form, the present condition of the German law in regard to the responsibility of professional men, as deduced from the decisions of the courts. Somewhat similar presentations of the subject have been made in France, in manuals drawn up for the use of architects, and it is hardly necessary to say that they are of great value in enabling professional men to direct their attention to the points where it is most required, besides, perhaps, in giving them courage to resist successfully the extravagant assumptions often made by clients in regard to the responsibility which, as they claim, architects incur. American architects, however, should remember, in reading the German rules, that they are not applicable to this country, and reliance upon them here would be likely to lead to serious trouble.

FOR example, in Section 4, it is shown that, according to German decisions, "an architect or engineer is not liable to his employer for damages arising from his neglect to comply with laws and statutes which are not in force at his place of domicile, unless such have been previously made known to him by his employer, or it can be shown that he had previous knowledge of the same from other sources." Although we think there are no authoritative American decisions on this point, we doubt very much whether our courts would agree with those of Germany in their views. Undoubtedly, an architect would not be expected to be familiar with local customs in a strange place, in which he was building for the first time; but it seems to us that our law would consider him bound to acquaint himself with the matters of public record, such as the statutes and ordinances relating to building, which he must know in order to carry out his designs without bringing his employer into conflict with the public authority. It is true that, as the German law appears to require, an owner may acquaint himself with the local building regulations, and communicate them to the architect, and it would be a wise precaution for him to do so; but the architect, as the man of science, is the one who can study them most intelligently, and to best advantage, and it is hard to see how he can do his full duty to his client unless he makes himself familiar with them; or, at least, takes the precaution to have his plans and specifications reviewed by some one competent to see that they comply with such regulations. On the other hand, the doctrine of the French and German codes, that, where the architect is entrusted with the supervision of the work of mechanics, and the mechanics succeed in doing their work badly without detection, the architect is bound, if the builder is insolvent, and unable to pay the cost of making his bad work good, to pay it for him, is not held, or rather, is distinctly repudiated by our courts. In the admirable charge to the jury in a Maine case, which we printed, from the notes of the Court stenographer, a few weeks ago, it was stated at the outset that to the contract between the owner and the builder the architect is not a party; and the insolvency of the builder could not make the architect a party to his contracts, or a guarantor of his liabilities, unless the architect had agreed to assume such a responsibility, or unless, as by the French Code Civil, and presumably, by the German Code, the statute law expressly laid it upon him. So far as we are aware, no statute exists in any of our States imposing such a burden on architects and engineers, and the members of those hard-worked and ill-paid professions may be tolerably sure that, if they do their work with faithfulness and skill, they need not fear ruin through the sudden imposition on them of the liabilities of a bankrupt contractor.

IN regard to superintendence of work, the German rules, following, no doubt, local professional customs which have been upheld by the courts, distinguish between general and special superintendence, the latter involving certain responsibilities which the former does not. It is hardly necessary to say that no such distinction is known here among architects, although our engineers have something of the sort. Among our engineers, however, special superintendence, in the German sense, commonly takes the form of stationing an assistant, who is paid by the day, or hour, as the case may be, to examine materials, particularly iron and cement, or to give continuous inspection to, perhaps, the compounding and laying of concrete. The general supervision of architects is also, in important work, usually supplemented by the services of a clerk-of-works, who is paid by the day by the owner of the building. The clerk-of-works, however, is often a total stranger to the architect, and neither his neglect of duty, nor that of the engineer's inspector, would ordinarily impose responsibility on any one but the owner, who employs him.

WE have received and looked over, with our usual pleasure, the Report of the Proceedings of the Eighth Annual Convention of the National Association of Builders, which was held in Boston last February. Before we comment upon it, we are disposed to call the attention of the members of the Association, perhaps not for the first time, to their good fortune in having so long enjoyed the services of their present Secretary. Among the scores of Reports which come to us every year, there is not one which, to our mind, shows more clear-headed mastery of its subject than those of the National Association of Builders; and, incidentally, the substance of the report often shows in a very favorable light the tact and discernment with which Mr. Sayward, as the most active officer of the Association, carries out his duties.

AS in other cases, the Association has suffered through the business depression of the past year. Six of the affiliated organizations have been dropped from membership, and only two new ones have been added. In most cases, the deserting members seem to have got tired of paying the dues, and the San Francisco Exchange very frankly reported, in giving notice of withdrawal, that it was so far away, and the customs of building on the Pacific coast so different from those prevailing in the East, that it did not think further connection of any use. In commenting on this, the Secretary observed that one of the San Francisco members, not long ago, became involved in a controversy resembling that of McNeil *vs.* Boston Chamber of Commerce, in which a builder, who had been assured that a certain contract would be awarded to the lowest bidder,

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secured heavy damages for its award to parties whose bid was higher than his own. The National Association kept a careful record of the case for the benefit of its members, and on the application of the San Francisco man, sent him a full account, which seems to have assisted him materially in winning his own case. Mr. Sayward observes that the sum involved, which the assistance of the National Association helped to win, would have more than paid the dues of the San Francisco Exchange to the National Association for twenty years, and yet the San Francisco Exchange withdrew because the National Association was "too far away to be of any service." As he well says: "This is a remarkably good illustration of the failure of individuals to realize the indirect value springing from associated effort, and which could not be gained to anything like the extent through individual effort. . . . It is only through that entity which we call organization, or, as I prefer to designate it, associated effort, that it becomes possible to make the experience of the individual largely available. . . ." This remark is well put, and should be taken to heart by the members of all professional organizations.

WE have received two documents describing a competition for a certain church, one from a member of the church committee, who thinks we might like to publish it, for the benefit of our readers, apparently because he supposes it is so good, and another from an architect, who also thinks it would be beneficial to have it published, because it is so bad. On studying the documents themselves, it appears to us that neither of our correspondents is right, and that the programme is neither very good, nor very bad. There is none of the shameful evidence of intended trickery which is so easily detected in many competition programmes; on the contrary, the paper indicates an intention on the part of the church committee to treat architects fairly, if somewhat austerely; and its failure, which is certain to interest respectable members of the profession, will be due less to any intention of treating them unfairly than to ignorance of the duties which architects are called upon to fulfil. For example, the programme, after saying, with a frankness which is rather attractive, that "The entire cost . . . must not exceed $45,000 . . . and if we can get what we want for less money we will be pleased," and giving a very reasonable description of the style and number of drawings required, goes on to say that "Complete building specifications must be attached, accompanied by an estimate of the cost. The correctness of this estimate must be guaranteed by the architect, his guaranty to be secured, first, by the amount of his own fees, and, secondly, by such other security as the Committee may require, it being the intention of the vestry not to commence the work until reasonably assured of the cost."

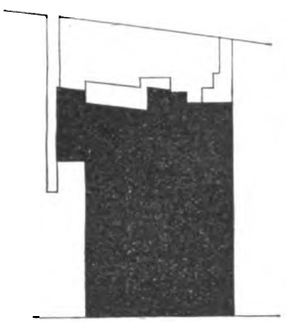
IT is a pity that, before making this extraordinary stipulation, which will cause every respectable architect, whose guaranty is worth anything, to throw the paper into the waste-basket, the Committee had not consulted some member of the profession, or, at least, some one who knew a little about an architect's work. He would have told them that to write "complete building specifications" for such a structure is well worth the six or seven hundred dollars that any architect whose specifications are of any value would charge for making them; that specifications which would be anything but misleading could not be written except in connection with a set of fifty or sixty completely finished working-drawings, for the preparation of many of which elaborate calculations of weights, supports, thrusts, ties, buttresses, wind-pressure and counter-bracing would be necessary; and that to do this work with even moderate care would require, at least, three months' time in any architect's office. As to the "estimate of cost," he would tell them that, while an architect can estimate, if necessary, the amount of work and material shown by his designs, and can say quite accurately how much such work and materials will be worth, at current prices, it is utterly impossible for him to know anything about the combination of builders, or the other circumstances which will affect the actual cost. The estimates of most builders are almost pure guess-work. We have heard a builder, with a large business, too, say that he never read a specification. He "counted the pages," as he said, and made his proposal accordingly. We knew another man, who was the lowest bidder for a large building, — a church, if we are not mistaken. The contract was awarded to him, and the building was well along before he discovered that the plans on which he had made his estimate were drawn at a scale of one-eighth of an inch to a foot, instead of the usual one-quarter; and, although the scale was plainly marked on the drawings, he had based his proposal on an estimate which made the cubic contents of the building only one-eighth of what they were required to be by the contract which he had signed. It may be imagined that architects who have either money or reputation to lose, never, under these circumstances, give any guaranty of the cost of executing their designs. They are willing to use their best judgment and experience, and most good architects can tell with tolerable accuracy how much, under average conditions, a given building should cost; but to warrant the caprices of local contractors would be a piece of folly which would stamp an architect, in the mind of the profession, as reckless and irresponsible. Of course, it is not unnatural for the Committee to wish to be sure of the cost of their building before beginning work, but the way to do this is not to drive away all the careful and skilful architects, and invite solely the reckless and dishonest ones, who have no money to lose, and know plenty of secret ways by which they can reimburse themselves for whatever part of their legitimate fees the Committee may confiscate; but to secure designs from men of skill and experience, by the offer of rational and decently remunerative terms; then, to have the designs judged by another skilful and experienced architect, who will throw out all that, in his judgment, cannot be executed for the sum proposed; and, finally, after the architect thus selected has reviewed and worked up in detail all the points of his design, to invite bona-fide tenders from responsible contractors for carrying it out. If the tenders are too high, the architect will modify his designs without charge, until a satisfactory result is reached; and, with a good contract, a good architect, good plans and good specifications, the building can be carried out without a dollar of extra expense; while, with an ignorant architect, unskilful plans, and specifications, and a careless contract, no guaranty on the architect's part, even if it could be enforced, which would very rarely be the case, can save such a committee from having to pay much more than it is worth for an ignorant, discreditable and unsatisfactory building.

ARCHITECTURE AND BUILDING makes some observations, which cannot be too often repeated, about the great advantages which are now offered for the erection of fireproof buildings. It says, what is undoubtedly true, that the movement toward the building of large structures for offices, which promises to give our builders and architects much employment next year, is due rather to the desire of capitalists to take advantage of the low prices now current for structural iron and brick, than to any extraordinary demand for offices; and suggests that fireproof construction might now be extended to dwelling-houses without a very serious increase in cost. We cordially sympathize with this idea, and will add another consideration, — that dwelling-houses of iron and terra-cotta are not only far cheaper in the end than those with floors and partitions of wood, but are much pleasanter to live in. A single visit to a city house fifty years old will convince even a layman that the shrinkage, bending and twisting of wooden beams and studding is the main agency in the deterioration of such buildings. No sooner is the roof on a house built with wooden beams than the staircase headers and trimmers begin to shrink and settle, the floors to descend, the partitions to distort themselves, the doors to bind, the plastering to crack, and the whole house to enter upon a process of decay which becomes every year more pronounced. With iron beams and terra-cotta partitions none of these phenomena are observed. The partitions, stairs, doors, floors and plastering stay just where they were originally placed, and are sure to remain there indefinitely. Walls and ceilings can be expensively decorated without the certainty that the painted plaster will be cracked, and, perhaps, thrown off, in twenty or thirty years, and the owner of such a building can await tranquilly its fiftieth birthday, with the assurance that it will then be in the prime of its beauty, while its wooden-timbered neighbors will be a mass of repairs, if they are habitable at all. Already, many such houses have been built in New York, and a great deal of iron is now used by architects to trim around stairs, and support partitions, in city dwellings; but the unshrinkable iron beams, unless skilfully used, are apt, when used in connection with shrinkable wooden ones, to cause ridges in the floors, and it is much better to adopt iron or steel exclusively.

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THEATRES. — III.

ROYAL ALHAMBRA THEATRE, LONDON.

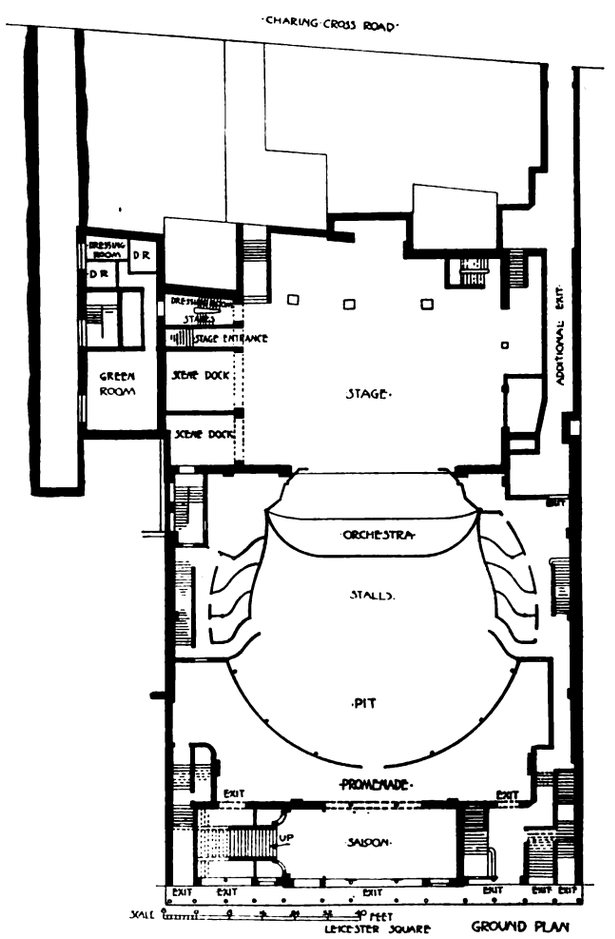


ON the morning of December 7, 1882, I well remember visiting the ruins which the fire of the previous night had left of the old Alhambra Theatre. This fire was the last theatre fire we have had in London, and it occurred in the night after the audience had left the house. The original building was designed by Prof. Hayter Lewis, F. S. A., as the "Royal Panopticon of Science and Art," but after a varied career it was eventually converted into the Alhambra Theatre, the minarets and dome of which were familiar features of the west end of London for over a quarter of a century.

Naturally, a building designed for one purpose and adapted to another would not be as perfect as one designed for its special purpose; so it was with the old Alhambra Theatre; to adapt it to a theatre, many interior fittings and partitions of wood rendered it an easy prey to the flames, and a total wreck of fallen walls, twisted girders, broken columns and charred beams lay in a mass in the morning, where the night before had been crowds of spectators witnessing the performance.

It was not long after the fire before the architects of the present building, Messrs. Perry & Reed, completed the theatre of which I am enabled through their courtesy to illustrate the drawings in this number. On December 3, 1883, the new house was opened to the public.

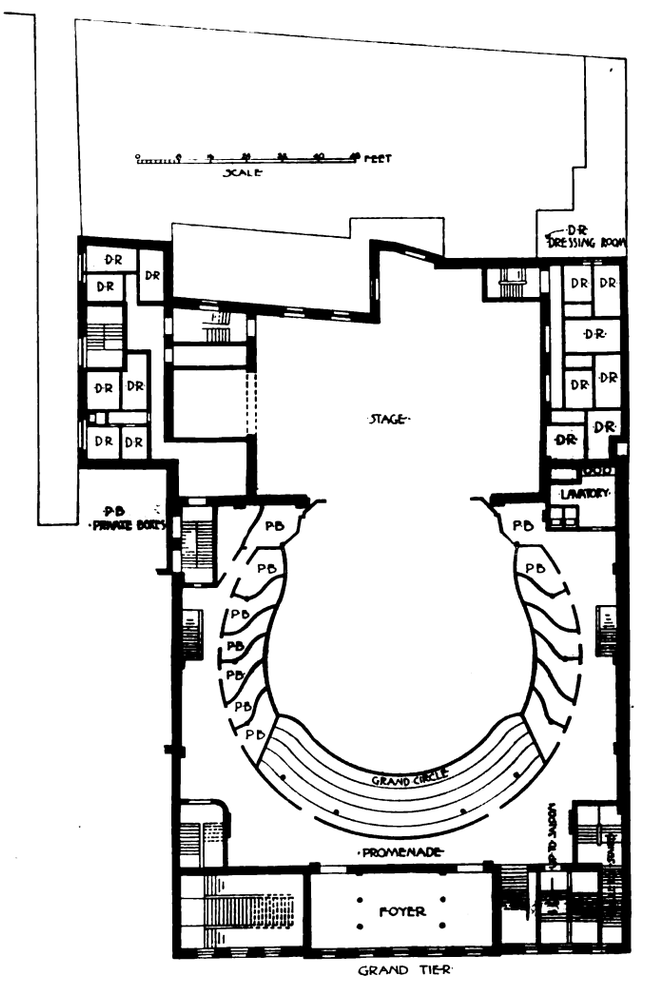
This fire has not been without its attendant benefit to the London play-houses, for Messrs. Perry & Reed were among the first to set the example, now almost universally followed in London, of building theatres of iron, steel and concrete, with the iron-work protected and embedded in the concrete. In this case the concrete was formed to a great extent of bricks of the old building, broken up by powerful steam crushers, and mixed with Portland cement; the new building thus, literally, springing up out of the ruins of the old. The whole of the floors, galleries, roofs, partitions, box-divisions and staircases, were constructed of this fire-proof material, no timber or wood-work, other than for the furniture, being used anywhere except for the stage, and where wood-work was thus used it was treated with asbestos paint.



Another feature in this theatre is that it was also among the first, if not the first, to be conceived with overhanging balconies unsupported by columns. I am able to give an illustration of the cantilever system by the kindness of the architects, who were assisted in the designing and testing of this part of the work by Prof. A. B. Kennedy, C. E. of University College, London. As one of the first theatres carried out with fireproof tiers on cantilever girders, this house calls for special attention.

Theatres, like other buildings, want periodically an army of painters and decorators to attack them, clean them down and put a fresh and new face upon them; this has to be done perhaps more frequently than in other buildings, because a theatre must never look dull or shabby. Now the Alhambra Theatre is unique in many respects: it has no special season, its doors are open all the year round, for the class of entertainment given is spectacular, and consists of sumptuous ballets, variety entertainments and comic sketches. The house, therefore, being always open and, I may also say, always full, whatever the time of year, there being no "off season," it would not do to give it over for a month or six weeks every year for the annual cleaning, and to have the auditorium filled with scaffolding. Now the architects were very far-seeing in this respect, and they have so constructed their building that the cleaning and decorating can go on without closing the house. The most difficult part to deal with was, of course, the ceiling, which as will be seen by the section is a dome. This dome is constructed of light iron framing and fibrous-plaster panels, being so arranged that whenever re-decoration may be required, it can be readily executed by lifting out the panels from the upper side and re-painting them, and then replacing them from the gallery which is placed between the ornamental dome and the constructional roof.

The upper dome, which can only be seen from the outside, is formed of iron ribs springing from the columns to a central ring which supports the cupola, and the under dome is of lighter iron affixed to the former.



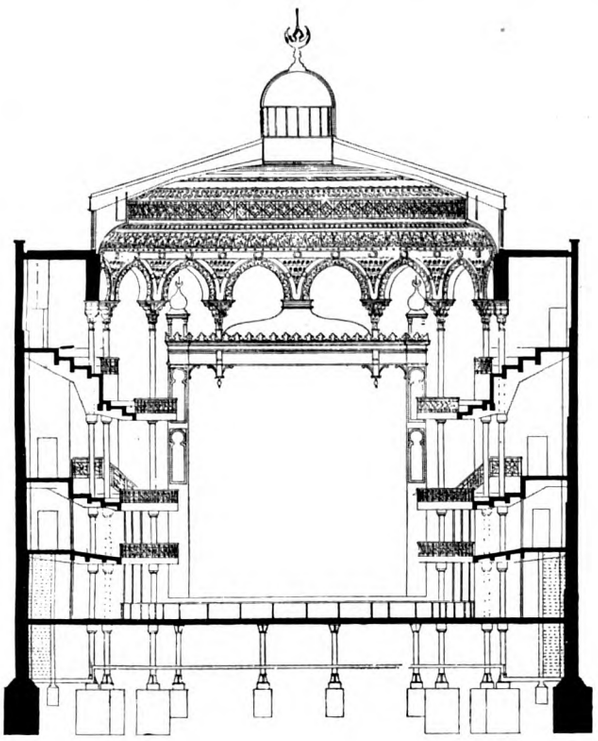
The lower part of the dome is a quarter circle, in section, surmounted by a lofty gilded railing, and open in the centre to the outer dome for purposes of ventilation, and concealing an iron gallery which gives access to the interior of the roof.

In examining the plans, the *raison d'être* of this theatre must be

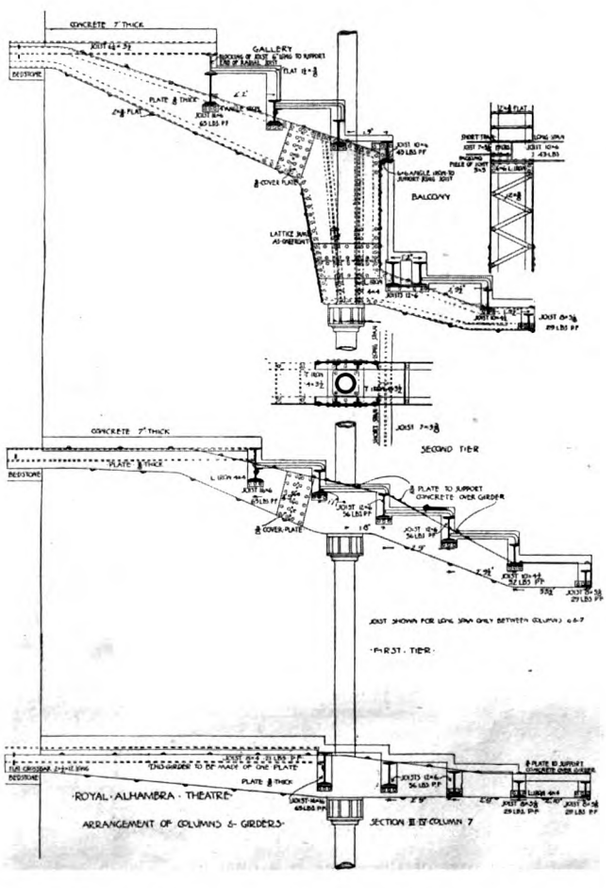
[1] Continued from No. 959, page 60.

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borne in mind. It was designed for a special and particular class of entertainment—an entertainment coming between the stage plays of a theatre and the variety turns of a music-hall. It was neces-



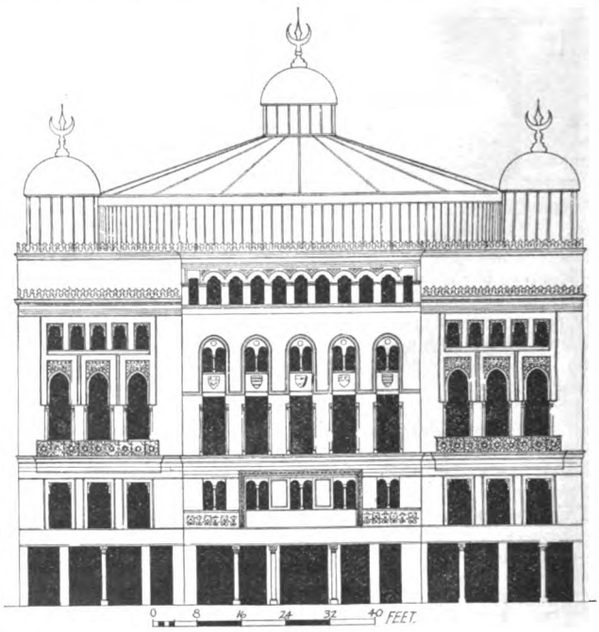
sary, therefore, to provide comfort and space for the seating of the audience and at the same time to have ample promenade and circulating space for those who only desired to be seated during certain



parts of the entertainment. Another point had also to be considered; as smoking is here allowed in the auditorium, special attention had to be given to the free circulation of air and ventilation, with the result that the "Alhambra" is never stuffy or clouded with tobacco smoke, however full a house there may be.

The proscenium, like the dome, is of fibrous plaster, and the hood is provided as a sounding-board; it also serves the purpose of concealing the massive iron girder that spans the opening; which girder is forty-four feet long and six feet six inches in depth. The width of the "sight" of the proscenium opening is 32 feet, and the height 41 feet.

The stage, which is sixty-two feet wide by an average depth of about forty-five feet, is provided with all the necessary appliances



and machinery for spectacular representation, and there is a height from the basement floor to the gridiron of eighty-four feet, for the working of the scenery. The gridiron is supported upon a wrought-iron truss sixty-two feet in length.

The dressing-room accommodation is in accordance with the requirements of the house, and all the floors, roofs, staircases and passages are constructed of fireproof materials, in the same way as they are in the auditorium, so that the employés have the same care taken of them as the public.

To return to the auditorium: The ground-floor, which is on the level of the pavement, is occupied by stalls and pit, each with their separate approaches. The main dimensions of this part of the house are 96 feet between the side walls and 82 feet from the curtain line to the back wall.

The grand tier over the pit is fitted with "stall" seats in the centre, the sides being arranged as private boxes. The seats have been somewhat altered of late, the front rows being brought nearer the stage, and the standing space at the back increased. The plans here given are as the building was designed by the architects. On this tier is a foyer and on the tier above the grand saloon. The distance from the box front of the second tier to the curtain line is sixty-two feet.

There are two galleries over the second tier; each of these parts have their separate entrances.

The exterior was little altered after the fire, the architects merely adapting it to the requirements of the new plan. One provision was however made, which must be a welcome one to those awaiting admission on a wet night and for those alighting from carriages in evening dress. A glazed veranda stretches the full length of the front of the building and the full width of the pavement; from under this the entrance and exit doors are approached. This veranda rises from the theatre, the highest part being over the pavement and the lowest next the building, with a slope towards the building; the water is thrown backwards and there is no drip on the people as they enter their carriages. This arrangement also provides against columns on the edge of the pavement, which frequently cause the smashing of carriage doors.

E. A. E. Woodrow.

[To be continued.]

Subterranean London.—It gives an impressive idea what subterranean London is fast becoming, to learn that, on emerging from the river, the new City and Waterloo line will, in its passage up Queen Victoria Street, run for a part of the way underneath the low-level main sewer, which in its turn runs along beneath the District Underground Railway. So that at this point in the city we shall have, first, a busy main thoroughfare, below that a steam railway, then a huge metropolitan sewer, then an electric railway, reaching its terminus at a depth of about sixty-three feet below the streets, and here it will communicate with another line—the Central London—which will lie at a depth of eighty feet.—*London Daily News.*

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WHAT COEFFICIENTS SHOULD BE ADOPTED FOR THE TRANSVERSE STRENGTH OF TIMBER.

ALTHOUGH the strength of timber is not as important a question, in these days of iron and steel construction, as the strength of the metals, still, owing to the increasing cost of timber, and the probability that wood will be, for a long time to come, the principal constructional material of at least three-fourths of the buildings erected in this country, it is of sufficient importance to demand careful consideration, and the use of such coefficients as shall ensure ample safety without unnecessary waste of material.

The recent building laws of the cities of New York, Boston and Chicago contain maximum values for the unit strains in timber, a feature not before included in these laws; but considering the fact that very thorough tests have recently been made on the transverse strength of our principal building woods, it would seem as though the requirements of these building laws, in this respect at least, should be practically the same. Such, however, is not the case, and neither do the standard works treating of the strength of materials agree much better. Believing that there should be great uniformity in the coefficients for the transverse strength of timber, the writer has undertaken to present a comparison of the experimental data bearing on the subject, and also of the practice of building engineers, hoping that it may result in a greater uniformity in the values published in our standard works, and in the building regulations.

The first person who endeavored to compute the strength of beams upon mathematical principles is supposed to have been Galileo. It appears that this philosopher was led to these investigations in consequence of a visit which he made to the Arsenal and dockyards of Venice, and that they were first published in his dialogues in 1633. He considered solid bodies as being made up of numerous small fibres applied parallel to one another, and concluded that their resistance to a pulling-force applied parallel to the length of the fibres was directly proportional to the area of the transverse section, and this is still the theory in use to-day.

He next considered in what manner the same fibres would oppose a force applied perpendicularly to their length, and ultimately came to the conclusion "that when a beam is fixed solidly in a horizontal position in a wall, or other immoveable mass, the resistance of the integrant fibres is proportional to their sum, multiplied into the distance of the centre-of-gravity of the area of fracture *from the lowest point*." In his general theorem of the strength of beams, he asserts that the strength or breaking weight is also proportional "to the length of the beam, or the distance at which the weight acts from the point of support."

He also endeavored to show that whatever weight is sufficient to break a beam fixed at one end and loaded at the other, double that weight will be necessary to break a beam of equal breadth and depth, and of twice the length when supported at each end and loaded at the centre; and four times the same weight when each end of the beam is fixed solidly in a wall. In these conclusions, he was right as to the relative strength of beams in relation to their span and method of support, but he was in error in several of his hypotheses, viz.: first, in assuming the beam to be inflexible; second, that the fibres are inextensible and incompressible; and thirdly, that the beam turns about its *lowest* point when fixed at one end, or its upper when supported at both, and, therefore, that every fibre in the section is exerting its force *in resisting extension*.

As soon as it was attempted to compare Galileo's theory with experiments (which he himself had never done) it was found that the results did not agree. It is supposed that the first person to compare this theory with actual results, was Mariotte, "a member of the French Academy, who, having soon discovered its inaccuracy, proposed to substitute another theory in its place, which was published in 1680, in his '*Traité du Mouvement des Eaux*,' and here we find the first notice of extensible and compressible parts of the section of fracture, the neutral axis, etc."

This attracted the attention of Leibnitz, who, after examining the theory of Galileo and the experiments of Mariotte, published his own views on the subject in a memoir which appeared in the Leipsic Acts, in 1684. He adopted the principle first suggested by Dr. Hooke, that "the tension varies with the force," and concluded that every fibre exerted a power of resistance proportional to its distance from the line about which the beam was supposed to turn. This was one step nearer the correct solution of the problem, but he still considered the fibres to be incompressible, or that the beam turned about its lowest or highest point, according as it was fixed at one end or supported at both.

The subject was afterwards taken up by James Bernoulli, who made some experiments, and observed that the instant before a body is broken across with a transverse strain, a part of the fibres only are in a state of tension, and a part in a state of compression, and, consequently, that the line about which the beam turns is somewhere within the area of the section of fracture. But he unfortunately stopped at this point, merely contenting himself with stating a few general observations, and pointing out the difficulty of determining the neutral axis, or that line which suffers neither extension nor compression.

The next important step in this inquiry was made by Dr. Robinson, under the article "Strength" in the first editions of the "*Encyclopædia Britannica*," in which the position of the neutral axis is introduced as a necessary datum.

The first person, however, to arrive at the correct solution of the problem and to deduce working formulas for the strength of rectangular beams was Mr. Peter Barlow, who first published his conclusions in an "*Essay on the Strength of Timber*," in 1817.

Mr. Barlow deduced formulas for the strength and stiffness of rectangular beams, which correspond with those now generally adopted, and also verified their results by an extended series of experiments on small wooden beams. He also made a number of tests on small beams two inches square and from six to seven feet long, for the purpose of determining working-values for the coefficients for strength and stiffness. These afford the first practical data with which the writer is acquainted, although M. Buffon had previously made an extended series of experiments, under the auspices of the French Government, on timbers varying from four to eight inches square and from twenty to twenty-eight feet in length. It does not appear, however, that he made any practical use of his results.

Formulas. — The formula which Mr. Barlow deduced applied only to rectangular beams of wood; his formula for the breaking-weight of a beam supported at each end and loaded at the centre, being:

$$W = \frac{4\,b\,d^2\,S}{l} \qquad (1)$$

in which W denotes the breaking-weight in pounds, b and d the breadth and depth of the beam in inches, and l the length of the beam, also in inches. S represents a constant quantity determined by experiment.

For the deflection of a beam under the above conditions, his formula is:

$$\text{Deflection in inches} = \frac{W\,l^3}{32\,b\,d^3\,E} \qquad (2)$$

E denoting a constant determined by experiment.

The universal formula for the strength of beams derived from mathematical reasoning is:

$$M = \frac{R\,I}{y} \qquad (3)$$

in which M denotes the bending-moment, I the moment of inertia of the cross-section; y, the distance of the most compressed or most stretched fibre from the neutral axis; and R the modulus of rupture, or "the greatest tension or compression per square inch to which the most strained fibre of the beam is subjected, when the beam is just on the point of breaking," and sometimes called the fibre-strain.

For a beam supported at both ends and loaded at the centre, Formula (3) resolves itself into the following:

$$W = \frac{2\,b\,d^2\,R}{3\,l} \qquad (4)$$

or, if we use L to denote the length of the span in feet,

$$W = \frac{b\,d^2\,R}{L\ 18} \qquad (5)$$

For further simplification, we can let A represent $\frac{R}{18}$, when our formula becomes

$$W = \frac{b\,d^2\,A}{L} \qquad (6)$$

which is the simplest formula for the strength of rectangular wooden beams, and is the one used by the writer in the "*Architects' and Builders' Pocket Book*," also by Hatfield, Haswell and others.

The S of Barlow, Formula (1), is one-sixth of R, or three times the value of A. Variations of Formula (6) for different conditions of loading and support can be found in the hand-books above mentioned. In nearly all of the experiments that have been made for determining the resistance of timber to a transverse strain, the results have been given in terms of the modulus of rupture, as this term has the same meaning in all technical works. The method of determining its value in pounds is by substituting the breaking-weight determined by actual test with the actual dimensions of b, d, and l in Formula (4), and equating for R.

The standard formula for the deflection of rectangular wooden beams supported at the ends and loaded at the centre is:

$$\text{Deflection in inches} = \frac{W\,l^3}{4\,b\,d^3\,E} \qquad (7)$$

in which E represents the modulus of elasticity, or the weight that would be required to stretch a rod, one square inch in section to double its length, if Hooke's law held good up to that point, and the rod did not break.

Its value in pounds for different woods is obtained by weighting a beam within the elastic limit, and carefully measuring the deflection; knowing the deflection, weight and dimensions of the beam, the value of E can be easily computed from Formula (7).

To make practical application of the "modulus of elasticity," it is necessary to assume a limit to the deflection of a beam, and then calculate the load which will just produce this deflection.

The greatest allowable deflection in a beam is generally limited to $\frac{1}{360}$th of an inch per foot of span, although it is sometimes limited to $\frac{1}{480}$th of the span. The iron companies in their hand-books use the $\frac{1}{360}$th limit for steel and wrought-iron beams, and such is the general practice of building engineers, for both wood and metal.

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Substituting this value for the deflection, and transposing Formula (7), we have

$$W = \frac{b\,d^2\,e}{L} \qquad (8)$$

for the greatest allowable load on a rectangular beam supported at both ends and loaded at the centre: L denoting the span in feet, and $e = \frac{E}{12{,}960}$ when the deflection is limited to $\frac{1}{360}$th of the span, or $\frac{E}{17{,}280}$ when the deflection must not exceed $\frac{1}{480}$th of the span.

These formulas are accepted by all authorities on the strength of materials.

Experimental Values for R and E: — The values of R and E recommended by Barlow were for a long time the only ones given in books treating of the strength of timber, and even in standard engineering works published as late as 1873, his values are given.

In the years 1874–6, Mr. R. G. Hatfield, the well-known New York architect, made a series of tests on small beams of American woods which attracted considerable attention and which were adopted by him in his "*Transverse Strains*"; for other woods he adopted the values of Barlow.

Mr. John C. Trautwine, in his "*Engineers' Pocket Book*," published values for the breaking strength of the principal American woods, which he gives as derived from his own tests, although no description of them is given. Owing to the great extent to which this book has been used, these values were for a time probably more extensively used than any others, and his table for the strength of white pine and spruce beams has been widely copied.

In 1879 Prof. R. H. Thurston made a very careful series of tests on small beams of Georgia pine, the results of which were published in the *Journal of the Franklin Institute*, for October, 1879.

During the years 1879 and '80, the writer made similar tests on Georgia pine, white pine and spruce beams, from which he derived the values given in Table 1.

These tests constituted about all the information available up to that time on the strength of American woods, and all these values were derived from tests on pieces about 1″ x 1½″, or 1″ x 2″ in cross-section, and from 3 to 5 feet span. They undoubtedly represented a better quality of wood than is generally used in actual construction, and this was recognized by using a factor-of-safety of from 5 to 8.

About the year 1874, Mr. Thomas Laslett made a number of tests in England, for the Admiralty, on three or four varieties of American woods in the shape of beams about 4″ x 8″ in cross-section, which did not vary much from the tests on small pieces above described.

During the year 1884, Professor Lanza commenced making tests on the strength of full-size timber beams, in the engineering laboratory of the Massachusetts Institute of Technology, which were continued until 1888, and the results are given in his work on "*Applied Mechanics*." These beams gave much lower values for the modulus of rupture than those previously obtained, but there was not as much difference in the values for the modulus of elasticity.

Mr. D. K. Clark describes some tests in his "Rules and Tables" which were made on large timbers and which gave results agreeing very closely with those obtained by Professor Lanza.

The Forestry Division of the United States Department of Agriculture have very recently conducted an elaborate series of tests on long-leaf yellow pine from Alabama, the size of the beams tested being 4″ x 8″, and 12 feet long. The values of R and E obtained in these tests are given in Table I; they are considerable above those obtained by Professor Lanza.

The average results obtained from the various tests above mentioned are given in Table I, which contains practically all the data that we have upon which to base our working coefficients for American woods.

TABLE I. — VALUES OF R AND E, DERIVED FROM EXPERIMENTS.

VALUES OF R.

	White Oak.	Georgia Pine.	Pitch Pine.[1]	White Pine.	Spruce.	Hemlock.
Barlow	10,596		9,792		6,612	
Laslett			12,254		9,045	
Trautwine	10,800		9,900	8,100	8,100	7,200
Hatfield	10,404	16,740		9,270	11,068	7,272
Thurston		16,740		5,280		
Kidder		13,048		8,297	11,000	
D. K. Clark			6,984			
Lanza	5,863	7,486		4,451 5,482[2]	5,046	3,825
U. S. Timber Tests.		10,960				

VALUES OF E.

Barlow	2,148,800		1,225,600		2,191,200	
Hatfield	886,464	2,441,664		1,222,500	1,362,960	956,880
Thurston		3,534,727		883,636		
Kidder		1,821,630		1,388,497	1,650,000	
Lanza	1,131,100	1,666,000[3]		1,122,000	1,367,500	922,250
U. S. Timber Tests.		1,757,900		1,183,037[2]		
		1,982,000				

[1] Pitch pine (*pinus rigida*) is a different and inferior variety of pine from the Georgia pine or *pinus palustris*.
[2] Western pine.
[3] Average from time tests.

Professor Thurston made about 40 tests on California spruce and Oregon pine, during the year 1880, and obtained 12,280 pounds as the value of R for spruce and 11,071 for Oregon pine.

D. K. Clark gives as the average value of R, obtained by testing pieces of American red pine (commonly called Norway pine), 12″ × 12″ (15′ span), 4,960 pounds.

Bauschinger recently made an elaborate series of tests in Germany, on the strength of certain foreign woods in connection with their other properties, as specific-gravity, age, time of felling, percentage of moisture, etc. The moduli of rupture and of elasticity obtained by him for spruce and pine are somewhat higher than those obtained by Professor Lanza on woods of the same name. This was probably owing to the pieces being a little less in cross-section, and also drier, and, perhaps, of better quality.

As Professor Lanza's tests were carefully and scientifically conducted, and were made on beams such as are commonly found in the market, it is generally conceded that they give the most reliable values for the average breaking strength of the woods tested, some beams giving values 40 per cent less than the average, and others 20 and even 60 per cent more. The United States timber tests on long-leaf pine, however, deserve fully as much recognition as those of Lanza, as they are undoubtedly fully as reliable.

In deciding upon the working coefficients for beams, there are several other elements to be taken into account, such as the effect of continued strain on timber, the quality of the timber, the accuracy with which the load can be determined, and the nature and continuance of the load.

From long time-tests on small beams made by Professor Thurston, and also by the writer, it appears that a timber beam might support for an indefinite period a load equal to one-half of its breaking load, so that a factor-of-safety of 2 would allow for the effect of continued strain. To allow for defects in the timber, a factor of 2 should be more than ample, considering that our values are based on ordinary merchantable timber, and this would give a total factor-of-safety of 4, which is the nominal value generally recommended. In the case of floor-beams, however, the assumed load is generally estimated at from two to four times the actual load, so that in such cases we really have a factor-of-safety of from 8 to 16, and the practical engineer will often vary his coefficient to suit the load which is assumed.

Having thus considered the fundamental data from which we have to work, and the factor-of-safety to be assumed, let us glance at the working-values of A and E recommended by the leading books of reference, and required by the building laws of three of our principal cities. A comparison of these values is given in Table II. The values given by Trautwine represent a factor-of-safety of 6, Hatfield of 5, Berg of 10, and the others of 4.

Troutwine recommends that a further reduction of one-third be made for moving loads.

TABLE II. — WORKING VALUES OF A (FORMULA 6) AND E GIVEN IN REFERENCE-BOOKS AND BUILDING-LAWS.

VALUES OF A [= R DIVIDED BY 18 × FACTOR-OF-SAFETY.]

	White Oak.	Georgia Pine.	White Pine.	Spruce.	Hemlock.	
Trautwine	100	100 to 142	75	75	83	1
Haswell	80	100 to 120	62	65	60	2
Hatfield	162	212	125	137½	112½	3
Carnegie	55	69	41½	41½		4
Berg	61	66	50	55	41½	5
Lanza	81	152[1]	61	70		
Kidder	75	104	76		53	6
World's Fair.	88	100	60	70	66	7
Boston	55½	99	66			8
New York	137½	70	42	42		9
Chicago	60	137½	112½	112½		10
		80	50			11

VALUES OF E.

Trautwine	1,500,000		1,600,000	1,600,000		12
Haswell	1,710,000	2,430,000	1,830,000			13
Hatfield	1,339,200	2,548,800	1,252,800	1,512,000	1,209,600	14
Berg	900,000	1,200,000	850,000			
Lanza	1,131,100	1,982,212[1]	1,122,000	850,000	800,000	15
Kidder	1,240,000	1,700,000	1,183,000	1,367,500	922,250	16
Boston	860,000	1,780,000	1,073,000	1,294,000	1,045,000	17
		1,300,000	750,000	900,000		18

[1] From United States timber tests.
Not specified in Chicago and New York laws.

VALUES FOR A, E AND e SUGGESTED BY THE WRITER.

	White Oak.	Georgia Pine.	Pitch Pine or Texas Pine.	Oregon Pine.	Norway Pine.	White Pine.	Spruce.	Hemlock.
A	75	100	90	90	70	60	70	55
E	1,130,000	1,700,000	1,296,000	1,300,000	1,150,000	1,100,000	1,300,000	900,000
e	87	130	100	100	88	80	100	70

For permanent loads, reduce values for A 20 per cent, and of E and e one-third.

The values in line 8, are those used by the engineers having charge of the construction of the World's Fair buildings.

The numbers in the sixth line represent one-eighteenth of the average values of R derived from Professor Lanza's tests, although

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the values which he recommends in his text-book are practically the same as those given in the Boston Building Law.

The writer, however, believes that such a great reduction from the experimental values, for beams supporting ordinary floor-loads is entirely unnecessary and uselessly increases the cost of building. Among experienced engineers and architects, when unrestricted by building-regulations, the variations in the actual size of timbers used for different classes of buildings is probably not as great as what the variations in Table II would lead one to expect, as they use a value of A corresponding with the assumed load; thus with an assumed load of 70 or 75 pounds for dwellings and tenement-houses, a high value of A would be used, while, if the assumed load was about what the actual load would be, a lower value would be used.

When, however, both the load and maximum unit-strain are fixed, as in Boston, New York and Chicago laws, it is important that a proper and reasonable value for each should be specified, as it is unjust to the mass of the people to oblige them to spend money for unnecessary material in building their homes. By a study of the values of A in Table II, it will be seen that those in lines 1, 2, 6, 7 and 8, agree very well with each other, and with the exception of line 6, they represent the practice of experienced engineers, — particularly those in line 8.

The variations in the ninth, tenth and eleventh lines are particularly noticeable, those in the eleventh line being in the opinion of the writer nearest to what they should be, although with a limit of 70 pounds per square foot for loads on house floors, they are still lower than is necessary. In the values for E there is not so much variation, and as floor-beams are about the only class of beams computed by the deflection formulæ, and they are seldom, if ever, loaded for any length of time with their full load, it would seem that the values given in lines 16 and 17 are small enough for good practice.

In conclusion, the writer, after a careful consideration of all information bearing on the subject, and from a wide experience in actual building construction, would suggest the values given at the end of Table II, as suitable for general adoption by architects, and for the maximum limit in building-regulations, for ordinary floor and roof construction; and for permanent loads, such as masonry and merchandise, to be reduced as indicated.[1] F. E. KIDDER.

THE RESPONSIBILITY OF GERMAN ARCHITECTS.

THE following rules, defining the responsibility of German architects and engineers towards their employers according to civil law, have been issued by the Association of German Architects' and Engineers' Societies. 1886.

INTRODUCTORY REMARK.

The following rules define the responsibility of architects and engineers who assist their employers in executing an architectural or engineering work, without undertaking such execution themselves by contract.

This responsibility is determined in various ways according to the existing laws, but in each individual case it may be limited by agreement.

In order to enforce these rules it will be sufficient to refer to them in the agreement, either verbal or written, entered upon according to the special circumstances of each case.

GENERAL RULES.

1. Any architect (engineer) is responsible, that the technical performance, which he has undertaken, shall be carried out under the generally acknowledged rules of architectural science.

But he is not liable for the technical performance being in accordance with the rules of æsthetics.

2. An architect (engineer) is liable for damages arising by default of his employés in the fulfilment of any performance of their official duties to the same extent as if such default had been his own.

3. An architect (engineer) is only liable for damages caused by delay in the fulfilment of any performance undertaken by him, provided that a special agreement has been entered into to that effect.

4. An architect (engineer) is not liable for damages arising out of the neglect to comply with laws and statutes which are not in force at his place of domicile, unless such have been previously made known to him by his employer, or it can be shown that he had previous knowledge of the same from other sources.

Neither is he liable for any disadvantage which is claimed by his employer because of a purpose remaining unaccomplished which the employer had in view when engaging his services, unless the same had been notified to the architect (engineer) at the time of engaging his services.

5. The liability of an architect (engineer) for defects in buildings or other works executed, if existing, is limited to the making good of the defect in the building or other work itself.

6. An architect (engineer) is not liable for damages arising out of any neglect in the performance of his duties, which would not have arisen, if he had had the control of the execution of the work, unless he has been charged with at least the general superintendence of the work.

7. In the case of an employer who for the accomplishment of a project furnished by an architect (engineer) calls in the services of craftsmen or contractors, the choice of whom has not been approved of by the architect (engineer), the employer is not allowed to hold the architect (engineer) responsible for any defect in the building or work, unless he proves that the craftsmen or contractors, respectively, whose services he has employed, possess sufficient technical or artistic skill for the carrying-out of such work.

8. Liabilities for defects in a building or engineering work incurred by an architect (engineer) in consequence of neglect in superintendence or control cannot be enforced, unless the person who has executed the building or engineering work be insolvent.

In case of such insolvency, it is incumbent upon the employer to prove that he has used due diligence in selecting the person who has executed the building or engineering work, unless the architect (engineer) has approved of the said person being selected.

9. The duration of liability of an architect (engineer) for work done with respect to a building or engineering structure which he has designed, or the construction of which he has controlled, does in no case exceed the duration of liability of the person who has executed such building or engineering structure. In any case, his liability expires after the lapse of three years, after the building or engineering structure has been taken into use, or the owner has been summoned to take possession of it.

The liability of an architect (engineer) for all other performances is limited to the duration of one year from date of completion of the work. The liability of an architect (engineer) for defects discovered in buildings or other works does not hold good, unless notice of such defects has been given to him and, failing an amicable arrangement, he has been served with a writ of judicial summons before the expiration of the aforesaid limitations.

SPECIAL RULES.

10. *Designs, Building-contracts and Agreements.* — Sketches are preliminary designs intended to show the solution of a technical problem. An architect (engineer) is not liable for deficiences in sketches.

Projects, detailed plans, descriptions, building-contracts and agreements must be as clear and explicit and must be made upon as large a scale as is required by the purpose indicated. They must be made in such a manner as to render it possible to execute the work in accordance with them.

An architect (engineer) is not liable for the dimensions indicated by designs, unless they be given in writing or in natural size.

Architects (engineers) are liable for damages arising to their employers out of neglect or non-observance of legal rules in the making of designs, or in the drawing-up of the technical part of agreements and building-contracts to the extent only of the amount which would have been saved to the employer if such neglect or non-observance had not occurred.

Architects (engineers) are entitled to demand that damages caused by their neglect be made good by themselves.

11. *Estimates of Costs and Values.* — In the absence of any agreement to the contrary, architects and engineers are not liable for mistakes and errors in calculation committed in general estimates of costs and in valuations. They are liable for the correctness of detailed estimates of costs as to the measurements and the labor and material required for the due execution of the building — reference, however, being made to the customary margin permitted by experience. But such liability is limited to the surplus of expenditure which arises to the employer from his having to pay for things omitted more than he would have had to pay if they had not been omitted, or from his having suffered a loss by the sale of things superfluous. Architects (engineers) are not liable for the correctness of prices indicated and of their calculation.

12. *Opinions and Reports.* — In the absence of agreement to the contrary, architects (engineers) are not liable for damages arising out of errors in furnishing opinions and reports.

13. *Superintendence of the Constructions of Works.* — *a In General.* — Architects (engineers) who are entrusted with the superintendence of construction of works are not allowed to order any alteration in the conditions of the construction laid down by plans or contracts, unless they be generally empowered to make such alterations, or that in working-out the project or the details it appears that the alterations are necessary from an artistic point-of-view.

No alterations are allowed which cause an increase of expenditure unless specially agreed to by the employer.

In case the employer encroaches upon the powers of the architect (engineer), the latter is freed from responsibility in regard to the points concerned by such encroachment.

b. Directing a Construction. — Architects (engineers) who are entrusted with the direction of a construction must give the explanations desired by those who execute the work, in order to make them understand the designs and the contents of the contract.

c. General Superintendence of a Construction. — Architects (engineers) who are entrusted with the general superintendence of a construction must from time to time, at intervals left to their discretion, either themselves or through their employés visit the building or other work. They must give the necessary instructions required for the furtherance of the work in progress, and order the removal of any deficiencies discovered by them on the occasion of such visits.

Their liability for defects of material or labor is limited to the defects of which they or their employés, respectively, have become aware during their visits and the remedying of which they have not ordered and tried to enforce by the means in their possession.

d. Special Superintendence of a Construction. — Architects (engineers) who are entrusted with a special superintendence of any construction must examine the materials and work as regards their being in accordance with the contract and as to their efficiency. They are liable for deficiencies which by a careful control could have been discovered — unless they have formally drawn the attention of the workmen, and in case of this having no result, of the employer also, to the deficiences — in so far, but in so far only, that they must replace the deficient work at their own expense.

It is understood that architects (engineers) who are entrusted with the superintendence of a construction undertake only the general superintendence, unless it has been expressly stipulated that they shall undertake the special superintendence.

[1] Since this article was written, the Colorado Chapter of the American Institute of Architects have drawn up a new Building Ordinance for the City of Denver, in which the values herein recommended have been adopted.

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14. *Taking Delivery of a Structure.* — Architects (engineers) who are entrusted with taking delivery of a structure must by trial-tests on the apparent parts of the building, or other work, check the existence of deficiencies. They are liable for deficiencies discovered and not made known to the employer, with this limitation, however, that they are only bound to refund to the employer the surplus of expenditure incurred by his having had to pay more in consequence of a rise in the prices of material or labor in order to make good the deficiences at the time of their actual discovery than he would have had to pay at the time when delivery was taken of the structure.

Special arrangements are required where the employer wants particular objects of technical work to be subjected to a special test and approval and the responsibility of the architect (engineer) for such examination and approval is consequently increased.

15. *Audit of Accounts.* — Architects (engineers) who are entrusted with the auditing of building-accounts must examine the correctness of such accounts with regard to the contract, or in case no contract has been made in writing, with regard to the fairness of the prices charged. Special agreements are required when the audit of accounts is to include the correctness, or the completeness and efficiency, respectively, of the objects charged in account.

Architects (engineers) are liable for mistakes in an account not corrected or brought to the notice of the employer by them, but only in case of the insolvency of the person who has issued the account.

16. *Final Rule.* — All rules contained under the head of Special Rules (10–16) are subject to the provisions of the General Rules (1–9).

THE POSITION OF THE CHOIR AND ORGANS IN CHURCHES. — II.[1]

THE DISCUSSION.

MR. H. H. STATHAM, who had been invited to take part in the discussion, wrote to say that he was prevented by another engagement from being present, but he sent the following remarks on the subject, which were read by Mr. Eales, one of the Honorary Secretaries: — In regard to cathedrals, I think the formerly usual position of the organ, on the screen between the nave and choir, was the best both for architectural effect and for the effect of the instrument, as long as the organ was of moderate size, and as long as the choir was practically the church, or when the choir and nave were not used simultaneously for worship. I do not think that position of the organ was at all detrimental to architectural effect,—rather the contrary. There is now, however, a growing feeling in favor of uniting the choir and nave, or having only a light open screen between, which necessitates the removal of the organ from that position; and the greatly-increased size of modern organs would render it impossible to plant the whole of the organ on the choir-screen in any case. Under these circumstances, I think a cathedral organ is best placed with the lighter portion bracketed out from one wall of the choir, and the heavier portion placed in the choir aisles, behind a screen; but the pipes must be concentrated, not scattered about as if they were playing at hide and seek in the choir aisles, as they are in one cathedral I could name; that takes away all the unity of effect of the instrument. The organ itself would sound better all built up in one case in the transept, but that is too far from the choir to blend with them or keep them properly in tune. The best of all arrangements for a cathedral, would be a small organ in the choir to accompany the choristers, and a large nave organ, either at one side or at the west end, to lead congregational singing: and with the present means of electric action the two could be brought under the control of the same player. For parish churches, I think there is no question that the best position for the choir in reference to the congregation, is the usual one, standing sideways and divided for antiphonal singing. The old west-end position of the choir placed them *behind* the congregation whom they were to lead, which was unsuitable; and to place them facing the congregation at the east end, though the best position musically, would be at variance with the idea of the simultaneous worship by choir and congregation, as well as placing them with their backs to the officiating priest. That being taken as settled, there is at present no place for the organ except in the chancel aisle or organ-chamber, which, as generally constructed, is simply fatal to the effect of the organ. The organ *must* be near the singers, however, and the bad effect of the organ-chamber may be lessened by making it much higher than is usually done, and by sinking the floor so as to get the bellows and the lower part of the pedal pipes below the floor, and the wind-chest on a level with the floor. The pipes will then have more space over them, and the sound will develop and get away better. In the usual low organ-chamber, we generally hear a great noise close to the organ, a large proportion of which does not get into the church at all. I consider, however, that all the difficulty arises from the faulty plan of our churches, and that reform should begin here. The adoption of the long chancel in which the choir are placed, is not only unpractical, as being the worst possible for the effect of the choir, but is, even from the point-of-view of orthodox precedent, without any reason for its existence. The long choir came into use in the latter days of the mediæval church, when the clerical body and their subordinate functionaries became very numerous, and required the lengthened choir to accommodate them all. They chanted the service, but they were shut off within a choir and behind a screen, *not* as choristers, but as *clergy*. In the present day there is no such large body of clergy connected with any church; the choir, whether paid or amateur, is a lay choir, and is properly part of the congregation, whose service of praise it is supposed to lead. But the choristers, who are no longer clergy, are packed into a long narrow chancel where they cannot be properly heard, necessitating also a most ineffective position for the organ, merely because such a position was once considered correct at a time when the clergy were themselves the choir. I cannot see that, even on the most orthodox High Church view of the matter, there is any reason for this arrangement. Let church builders return to the basilica plan, which was for centuries the accepted church plan, and which is exactly suited for our modern service,— the plan with the short chancel for the clergy and the altar, and the nave for the congregation; let them place the choir in the front portion of the nave (only seated sideways), forming, as they should, part of the congregation, and place the organ in a shallow transept adjoining them, and we should hear no more about the difficulties of placing the organ, etc. The whole difficulty arises from retaining, for a lay choir, on a mistaken idea of precedent, a form of plan intended originally to accommodate a numerous clerical body, which no longer exists.

The Chairman said the meeting had listened with very great interest to Mr. Brewer's interesting paper, and also to the supplementary remarks which Mr. Statham had been kind enough to send, and which appeared to throw some new light upon the subject. The whole question, it seemed to him (the Chairman) was to a large extent one of sentiment and ritual. Of course, looked at from an organist's point-of-view, the position for the instrument indicated by Mr. Brewer, in his drawing, was probably the best that could be chosen, although he had awarded very high praise to the position of the organ at Ratisbon, in the apse, at the rear of the altar. In the construction of an organ-chamber the object to be sought, he (the Chairman) took it, was to get as much height as possible, and to get the walls to act as sounding-boards, and probably curved surfaces would be the best. He understood Mr. Brewer to say that the plan of dividing an organ into two was objectionable, but in that they would probably not be all agreed. Did Mr. Brewer consider the arrangement of the organ at All Saints', Margaret Street, a bad one? However they might differ from him, however, they would all thank him for his paper, accompanied as it was by so many excellent and interesting drawings, for they were always glad to see his clever handiwork.

Mr. J. A. Gotch, in moving a vote of thanks to Mr. Brewer, observed that, fascinating as was Mr. Brewer's drawing showing his suggestion for the position of an organ, he should be very sorry to see all our cathedrals with the organ over the rood-screen or choir-screen. It seemed to him that one of the great effects of a grand cathedral, and one that stirred the beholder with so much awe, was the vista from west to east of the whole length of the interior. To cut the interior in half and so destroy the vista by placing the organ as suggested by Mr. Brewer would be a very great pity. But, of course, it was a matter of taste. No doubt the organist regarded the organ as one of the finest objects in creation, and would not have the least objection to its interference with the vista. But speaking for himself as an architect, he would rather see the whole length of the church than the finest organ that could be placed in it. It appeared to him that the west end of a church as the position for the organ had the sanction of antiquity, and was in all respects a very excellent place for the instrument, but the question was one for musical experts to decide. From an æsthetic point-of-view, he desired to raise his voice against obtruding the organ right into the middle of the church. He quite agreed with what had been said as to the improper positions often selected for organs. He knew a little church in Northamptonshire, the chancel of which had been rebuilt as the mausoleum of a neighboring ducal family, but quite recently there had been clapped right into the middle of it an organ, which had no merit whatever so far as the case was concerned.

Mr. W. A. Pite, in seconding the motion (in which he included the name of Mr. Statham), said he could bear testimony to what Mr. Brewer had said of the organ in the Cathedral of Ratisbon, where the music and singing were simply superb. With regard to the position for the organ suggested by Mr. Brewer in his drawing, it was to be doubted whether the clergy in the chancel would be able to make themselves heard in the nave, owing to the obstruction which would be afforded by the organ and screen to the passage of sound. There was an organ in Westminster Abbey in the tenth century, and there seemed to have been one at Winchester, erected by Bishop Elfeg, in 951, and which Wolstan, one of the the monks, thus describes: —

> Twelve pairs of bellows ranged in stately row
> Are join'd above, and fourteen more below;
> These the full force of seventy men require,
> Who ceaseless toil and plenteously perspire,
> Each aiding each, till all the wind be prest
> In the close confines of the incumbent chest,
> On which four hundred pipes in order rise
> To bellow forth that blast the chest supplies.

Mr. F. Farrow, in supporting the motion, said that with regard to the position of the organ, every one who was acquainted with the needs of the instrument would agree that it should not be placed where it could not make itself properly heard. One instance in which an organ was placed in a transept occurred in a

[1] A paper, by H. W. Brewer, read before the Architectural Association, London, February 2, 1883, and published in the *Builder*. Continued from No. 963, page 111.

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modern church at Armley, near Leeds. There the organ was a very fine instrument, and the wind was supplied by a hydraulic blowing apparatus located in a building outside. In Glasgow Cathedral it was a condition of the authorities that the organ should not be a prominent feature, and hence it was necessary that some of the pipes should be laid horizontally in the triforium. The effect, musically, was very good. Although, no doubt, the western gallery of a church was a very good position for an organ, the clergy were not likely to adopt such a position, owing to the difficulty of maintaining discipline amongst the choristers, who must, of necessity, be located near the instrument. It had been suggested that a large organ might be placed at the west end of a church, and a small one in the choir, but it was not easy to get them both to act together, and even if that could always be done, the sounds of both instruments could not possibly reach the ears of all the worshippers at precisely the same time, and the effect of this would often be unsatisfactory. Probably the best position for a church organ was that suggested by Mr. Statham, viz., a shallow transept, so that the instrument would be in a comparatively open situation, and close to the choir, without obstructing the view of the altar. An organ so placed would render it possible for the organist to bring out its full effect.

Mr. Hampden W. Pratt said that, as architects, they were more concerned with the question as to the best position for an organ in a church, than with the question as to the best place for a cathedral organ. An arrangement which might be suitable for a cathedral would not necessarily be appropriate in a parish church. Assuming that Mr. Brewer's remarks applied rather to the needs of the Established Church than the Nonconformist churches (in which there was no difficulty in arranging the congregational singing with reference to the organ), it occurred to him (the speaker) that if the chancel were made rather wider than was usual, the organ might be placed on one side of it without projecting to such an extent as to obstruct the view of the altar. Of course, if that were done, it would be necessary to give the instrument a more ornamental and architecturally-effective case than was at present the rule,—a plan which would be productive of much better results than merely decorating the pipes, for most people were rather tired of seeing organs with gaudily-decorated pipes inclosed in cases of no architectural character. While he quite agreed, however, with Mr. Brewer's contention, that organs should be more prominently placed, he was sorry to hear from him that the tendency was for organs to become larger and larger. If they became much larger than they were at present, how were architects to properly dispose them? Their difficulties in that respect were already sufficiently great. For his own part, he was of opinion that a great deal more money was, as a rule, spent upon organs than was necessary or justifiable, having regard to the other requirements of buildings intended for religious use. Some objection had been made in the course of the discussion to the position for an organ suggested by Mr. Brewer's drawing, but he presumed that the suggestion was only applicable to cathedral organs?

Mr. Brewer.— No, it applies to parish churches. The drawing is meant to represent the interior of a parish church 130 ft. long.

Mr. Pratt said, that being the case, he should object most strongly to the placing of the organ in so prominent a position, for to place it as suggested would be to almost make a god of it, an object of worship. Some of the speakers had spoken in derogation of congregational singing, but so long as that continued to form a part of public worship, architects must give due consideration to it in arranging the position of the organ. He agreed with all that had been said in condemnation of what was called the "organ-chamber," which should be abolished, and the organ placed either, as Mr. Statham suggested, in a shallow transept, or, better still, in his (the speaker's) opinion, in the chancel, which might, perhaps, advantageously be made the same width as the nave.

The motion having been put to the meeting, and carried by acclamation,—

Mr. Brewer thanked the meeting for the attention which had been given to his paper, and proceeded to reply to some of the remarks made in the course of the discussion. He observed, with regard to the scheme which had been criticised by most of the speakers, that he had simply worked it out because it had been suggested to him whether it would not be possible to place a church-organ in such a central position. He had, he thought, shown how it might be so placed with the minimum of obstruction. He was not prepared to say that, architecturally, it was the best position, but undoubtedly, from a musical point of view, it would be a good position for the instrument. He quite agreed with the observations contained in Mr. Statham's communication, except with regard to a small transept being the best position for an organ. A large organ very often occupied a space measuring 20 ft. by 20 ft., and 40 ft. high, and those dimensions would necessitate a large and lofty transept. The organ should never touch the outer or side walls, but a space should be left all round it, because, if completely enclosed on three sides, the only pipes which had a chance of properly speaking out were those on the unenclosed side, the pipes at the back being half stifled and unable to make their voices properly heard. It had been suggested that the organ, if placed upon the choir-screen, would prevent the voices of the clergy in the chancel being heard by the congregation in the nave. Well, upon that point he would only say that, extraordinary as it might appear, he never knew what the music in Westminster Abbey was really like until he happened one day to be shut in the nave while the service was going on. He had often previously noticed when in the transepts or choir that the music seemed to have a sort of muddled effect, but in the nave on the occasion referred to, he could hear distinctly every word that the clergyman intoned. That seemed to prove that the placing of the organ upon the screen would not prevent the voices of the clergy in the chancel from being heard in the nave of a parish church. As to the interference with the vista, he admitted that there was something very fine in the vista along the whole length of a large church, but mediæval architects certainly did not make the vista the paramount consideration in their interiors, otherwise, why did we always find that they provided screens in their churches and cathedrals,—sometimes, as at Durham, extending right up to the roof? In most Continental churches which had not been modernized, it was impossible to see entirely from one end to the other of the interior; indeed, it seemed to have been rather the intention of the mediæval architects to divide their churches. With regard to the practice of dividing organs, he regarded it as objectionable and unwise. In the first place, it added enormously to the expense, and in the second place the two parts had to be connected by what were called "trackers" passing beneath the floor of the church,— an arrangement which was very inconvenient, for if what was known as "cyphering" took place, the floor would have to be taken up to get at the trackers. Another objection was that when an organ was divided, the two parts would in all probability be subject to different sets of draughts and atmospheric influences, and thus one part would get out of order a great deal sooner than the other. With such an arrangement, too, the action was a great deal heavier, except where the new pneumatic action was in use, but this appliance, although very ingenious, was likely to get seriously out of order when the atmosphere was damp, and the result would he that the organ would "cypher" like a Board school-boy. The "pneumatic action" did very well for important organs in public buildings, which could be perpetually attended to, but it was too liable to get out of order for the general run of church organs.

LONDON EXHIBITIONS.

WHEN, I wonder, was the last "good" exhibition of the Royal Academy? Never, in my memory. Each year we hear: "Is it a good exhibition? Is there anything striking?" Some answer, "No," bluntly; others, less positive, find that there are a fair amount of "interesting pictures." Probably never has an exhibition within the walls of the Academy been pronounced "good," since the days of Reynolds and Gainsborough; and were even those great artists appreciated to their full by the contemporary and captious critic?

This year's show is much as usual, as it appears to me; many excellent works which stand out from an amazing amount of rubbish. People say the same of the Paris Salon, and probably they are right; but where London shines superior to Paris is in the wondrous number of feebleosities, if I may coin a word. The French rubbish is better worked; just as a French preacher forms his empty words into well-composed sentences, so his artistic compatriot clothes his stupid subjects in well-drawn bodies. The feeble works in Paris are few; in London, they are many — let us pass them by in sympathetic silence, although wishing that some of the rejected were in their place.

The number of works sent in is said to have been 15,000. Think of the aching hearts! Think of the worry and boredom of looking through so many pictures! and yet, at a meeting held quite lately, the Academy refused to limit the number of works allowed to each exhibitor. Now, supposing the Council to sit eight hours a day for twelve days (which I think *exceeds* the number of days given up to selection), and supposing this number to be correct, we find that each picture has about twenty-two seconds spent upon it. Can a fair judgment be possible in that time? and mark, that all the works are supposed to go up twice. But if each artist were limited to one or two works, they might all have a minute, more or less, to themselves. And again, if the numbers were limited, there would be more space to allot to others than ourselves, our friends, and our pupils. However, reform is difficult in all institutions; and the Champ de Mars Society has become a clique, even as the "Atelier Julian," (as the Champs Elysées Salon is called), from whose unfair ways, the former set broke loose. Perhaps, the old system in vogue during the Empire was, upon the whole, the best — that of having half artists and half government officials upon the jury.

Mr. Watts takes us back to Paolo Veronese, in his fine figure clad in rich yellow and green draperies — "And he had great possessions" —the painting of the emerald ring alone is a splendid study. So is the portrait of Sir Andrew Clark. Mr. Herkomer is not at his best in his "Lord Salisbury," that peculiarly unintellectual looking statesman; but the doggedness of the man is forced up, as it were. It is curious how, sometimes, a physiognomy may belie a man.

Curiously, for the first time in its annals, the Academy is bursting with patriotism in the way of battles; but, although blood and mangling of human bodies are not spared, one is not a scrap affected by the would-be horrors. The artists have been inspired probably by the success of Zola's "*Debâcle*"; but it requires personal suffering and personal knowledge to be a battle-painter. Is not that the

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secret of the pathos depicted by those great soldier-painters, De Neuville and Morot?

Two works, widely differing from one another, stand out in one's memory — Mr. Tuke's "August," and Mr. Hitchcock's "Mary at the house of Elizabeth." The former represents some boys bathing from a boat in a blaze of sunlight — perhaps one of the sunniest pictures ever painted, with the exception of those by M.M. Claus and Montenard, with which it has a certain kinship. Mr. Tuke is a young man, who has been steadily advancing for some years. Mr. Hitchcock's "Mary" is charming in its simplicity and scheme of color. The Blessed Virgin is standing in a garden of lilies — "Mary's flowers," as the Germans call them — and in the foreground is a mass of marigolds. The simple young Dutch face, in the quaint head-dress, is admirably painted; and not only is there a pathetic forecast of sorrow in the expression of the eyes, but the whole figure and background is harmony itself as regards color and composition.

Sea pictures abound as usual. Equally, as usual, Mr. Henry Moore exhibits those stretches of breezy skies and dark-blue waves, which give one the impression of being painted on long strips of canvas and then cut into lengths and framed. It is a pity that success should call forth monotony; nothing can be finer than Mr. Moore's seas — one seems to smell the salt, and feel the spray; but have we not had enough of the same thing? Mr. Somerscale's "Fight off Ushant, 1 June, 1794," is also a brilliant piece of sea-painting. The picturesque old three deckers with their high poops, are sailing about in majesty such as the modern turret ships do not possess. Shall we ever come back into the possession of ships instead of floating fortresses? Many things are less possible, and many landscapes are far less beautiful than Mr. Ernest Parton's "Moonlight" and Mr. Alfred Parsons's "Sunset after rain." Probably the glorious weather of last summer is answerable for the numberless summer moons — that twilight time when the sky is bathed in the setting sun's reflected light and the afterglow surrounds the "pale cold moon," giving it a pinkish-yellow glow. Mr. Herkomer, so great in portraiture, is not very successful in his nude lady standing in a rose-bush. And what does Mrs. Grundy say to this departure on the part of the professor and instuctor of her dear daughters? Nor can one commend Mr. A. Goodwin's fantastic Doré-esque "First Christmas morn," for who can say whether the Heavenly Cathedral here depicted in the most aerial of architecture, and seen in a vision by the Shepherds, is true or false? A study in blue, it certainly is. The painting of the wet nets which fished up Mr. Draper's "Sea-maiden" is excellent; but the fisher folk want strength and vigor. An excellent portrait is Mr. Waterhouse's "Mrs. C. Newton Robinson," a delicious study in white, and an excellent likeness. Pathetic are Mr. La Thangue's "Poor People," and another fine portrait is Mr. Solomon's "I. Zangwill, Esq." — most vigorous; but "what an ugly man," said a young lady behind me. How could that be helped? Another, to whom the same epithet might be applied, is the old Dutch shrimper, who has placed his basket on the floor, while he recites the Angelus. Mr. Sherwood Hunter has been most successful, both in man and shrimps, not only as regards the harmonies of blues and violets, but in the feeling of the picture. That old shrimper has a soul, and he is pouring it out to his Maker with all the force of a hard worker and toiler of the sea.

Mr. Arthur Hacker's "Sir Persival" is fine in conception; but the knight wants dignity, and the maiden, beauty. Mr. Marcus Stone lately married his interesting young people after a very long and tedious engagement; but it seems as if the marriage were not likely to prove a happy one, for here is another young man "stealing a kiss" while the lady sleeps. Or is it the husband? It certainly resembles him, though it might be a brother or cousin, but surely a husband would not "steal" a kiss? Mr. Frith has put his servant maid of "Sherry, Sir?" into the modern garb of cap and streamers, which is so becoming that years do not seem to have told upon that immortal personage. Not so Mr. Mark's delightful old man reading an "odd volume" at a book stall — a charming piece of character-painting, excellently interpreted. Mr. Solomon's "Paula Tanqueray," otherwise Mrs. Patrick Campbell, scarcely does that grand actress justice; it is an excellent likeness and a charming harmony, but it seems to want the suppressed energy which is one of the characteristics of the actress. To say that Mr. Solomon is not at his best, does not prevent him from occupying a far higher pedestal than most of his "betters," as regards position and reputation. The most ambitious picture yet produced by a woman is probably Miss Rae's "Psyche before the throne of Venus." Although not quite satisfactory in certain details, it is an excellently composed work, and gracefully executed.

Water-colors do not shine at the Royal Academy this year; they are of the "finished" order. But then, have we not had the Dutchmen and Frenchmen with us lately — those masters of pure water-color. Here, in London, we have few native *aquarellistes* in the true sense of the word; but, of the few, let me cite as masters of the art Mr. Arthur Melville and Mr. W. H. Allan. Penguin.

French Government sues the World's Fair. — Suit for $1,000,000 damages has been begun in the United States Circuit Court by the French Republic, against the World's Columbian Exposition. The litigation grows out of the French Government's claim for damages to exhibits of French subjects injured during the Manufactures Building fire. — *Exchange.*

OUR PUBLIC BUILDINGS: A SUGGESTION.

In the discussion growing out of the correspondence of the President of the American Institute of Architects and Secretary Carlisle, in reference to the designing of the Government buildings, it has been suggested by a very few of the newspapers, that the architects were governed purely by selfish motives. Unfortunately, in this matter, as well as in other matters of public concern, only those are interested to bring about a reform whose business or profession brings them in close contact with the evil to be remedied, and the correction of the evil may sometimes bring to them a more or less direct or indirect advantage. Should the designing of the buildings for the Federal Government be thrown open to fair competition, it is probable that not one in ten of the competitors, and not one in a hundred of the practising architects of the country, would receive any direct advantage, but all would be benefited in the general elevation of the taste of the people, by providing for the erection of buildings in accordance with the canons of good taste and showing evidence of a cultivated and artistic education on the part of their designers.

As an evidence of the sincerity of the motives governing the officers of the American Institute of Architects,— the only really representative body which can speak with any authority for the architects of the whole country — its president at the last meeting of the executive-committee of the Institute, in a discussion of the question of how to bring about the desired change and to secure the necessary legislation, made the proposition that the Bill now under consideration be so framed as to place in the hands of some of the great universities of the country the selection of a part of the jury whose duty it would be to formulate the programmes, select the most meritorious design, award the prizes for the best, and select the architects for the proposed buildings.

Suppose, for instance, that the selection should be left to Harvard College, Columbia College, and the Universities of Virginia, Chicago and California. These institutions have the elements of permanence and of wise and conservative management, and their officers are men who, from their position and eminence, possess a wide acquaintance, both among their own alumni and the leaders of men who are not college-bred, and their wide separation would ensure a selection which would be neither local nor provincial, nor political nor sectarian, but one which would command respect and would be readily acquiesced in by all who might take part in the competition.

An expression of opinion on this subject would be of value and would be a help to the committee just appointed to consider the whole subject, which is now attracting such widespread interest both in and out of the profession of architecture. F. A. I. A.

CHURCH FURNITURE.[1]

It is remarkable that the modern builders of organs, with one or two notable exceptions, have failed so completely to recognize their responsibilities and opportunities in respect to the external appearance and fitness of their work. It is no exaggeration to say that, when let loose in a church, the organ-builder, speaking generically, is the veritable bull in the china shop. For no antiquity, for no beauty, has he any reverence or respect. They are reserved for his 16 or 32 foot pipes. If he adds a case to his instrument, he drags out a stock pattern, stop-chamfered Gothic, "*very Early*," of the first quality. This, perhaps, he ornaments with some gilt-tipped iron-work, bedizened red and blue, which seems to have had its origin in Coventry; metaphorically, perhaps, its most appropriate destination. At stencilling in varied colored designs of the fleur-de-lis order, he has no rival. He contemplates his organ only as a huge square or oblong windbox, and this, although he has numerous modern mechanical inventions at his disposal which make it pliable and manageable in an extraordinary degree — methods unknown to our predecessors who turned out those grand combinations and designs, so instructive for our study. Here, indeed, is a field for the architect who enjoys openings for endless possibilities, a field which has been strangely neglected. There is none more seductive or more charming. True that it is full of technicalities and limitations which cross our path frequently; but the genial and accommodating organ-builder — when we are fortunate enough to find him — can help us to a remarkable degree. At its worst, the subject is one which common-sense, application, and tactful insistence can easily master. There is no attribute of the service demanding more earnest attention from all who have to deal with churches. The organs which have been permitted to disfigure some of the finest monuments in the country are, and will remain until remodelled, a disgrace, so far as their appearance is concerned, to the revival of church activity.

It is not only a question of the organ case to which I am referring. I know that funds often fail us to provide this. Sometimes it can never be added for this want. But the position, arrangement, and massing of the parts of the instrument itself are of first importance. If well done, the organ left only in skeleton can be made a fine object, and need never be an unsightly one while its grouped towers of pipes are waiting their clothing. In designing a new church, not only should the position and magnitude of the instrument be determined

[1] Extract from a paper on "Church Furniture" by W. D. Caröe, read before the Royal Institute of British Architects, April 23, 1894.

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at the outset, but in all cases should its grouping and case appear upon the original drawings, being fully as important in effect as any other portion of the structure.

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

SIDE ENTRANCE OF THE CABLE BUILDING, BROADWAY AND HOUSTON STREETS, NEW YORK, N. Y., MESSRS. MCKIM, MEAD & WHITE, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print, issued with the International and Imperial Editions only.]

THE sculptor of the colossal figures above the door was Mr. J. Massey Rhind.

ACCEPTED DESIGN FOR FIRST PRESBYTERIAN CHURCH, ELM STREET, NEW HAVEN, CONN. MR. F. R. COMSTOCK, ARCHITECT, HARTFORD, CONN.

THIS building will be erected in front of the present Sunday-school building and adjoining same. The exterior of front will be of granite to first sill-course, and Indiana limestone above to roof of porch; the remaining parts will be of buff terra-cotta brick and cream-colored terra-cotta. The columns at entrance will be of polished pink granite. Work will commence in the fall of 1894.

A TRIO OF ITALIAN ORGANS.

THE CATHEDRAL AT AUCH, FRANCE.

HOUSE OF J. LEVERING JONES, ESQ., CHESTNUT HILL, PHILADELPHIA, PA. MR. GEORGE T. PEARSON, ARCHITECT, PHILADELPHIA, PA.

[Additional Illustrations in the International Edition.]

SOUTHERN CENTRAL PORCH OF THE MANUFACTURES BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. GEORGE B. POST, ARCHITECT, NEW YORK, N. Y.

[Gelatine Print.]

CHAPEL OF THE GERMAN GOVERNMENT BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. HERR JOHANNES RADKE, ARCHITECT, BERLIN, PRUSSIA.

[Gelatine Print.]

A HOUSE IN BEDFORD PARK, CHISWICK, ENG. MR. R. NORMAN SHAW, ARCHITECT.

THE GARDEN FRONT, "ASHCROFT," ENGLAND. MR. W. F. UNSWORTH, ARCHITECT.

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

THE USE OF NEEDLES IN TUNNELLING.

PORTSMOUTH, May 22, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT:—

Dear Sirs, — Through a friend of mine I had the pleasure a short time ago of reading an article in your paper upon the "Use of Needles in Tunnelling." As engineer for the contractor, Mr. Henry Lovatt of Darlington Street, Wolverhampton, and the one to whose care the work was entrusted, I have thought you may be interested to have a few details respecting the method employed in carrying out the plan that was adopted.

The writer of the article in your issue of the 20th January last has clearly shown the nature of the difficulties that had to be contended with, whether the work had been carried out by the ordinary way of tunnel driving, or by that of "cut and cover" (the plan generally adopted where the ground above a tunnel is shallow); and it was in consequence of these difficulties that Mr. Lovatt, who had just then learned of Mr. Jenning's invention, took the matter of the needles up and ultimately became the possessor of the patent. He, from the first, became convinced of the practicability of the invention and of its adaptability to the work in question, and the success that followed its uses has fully proved him to be correct.

The needles, as your correspondent describes, were ten feet long, six inches broad and two inches thick. They were rolled to a section that permits an interlocking or sort of open hinge along the sides, which holds them together in position. The sketch, Figure 1, showing a cross-section of these bars so interlocked, will make this clear. Along the centre of the bars and for their whole length 1¼″ holes were drilled, 6″ apart, and when the needles were required to be advanced, steel studs were inserted into these holes. Against these studs one end of a "ratchet-screw-jack" was placed, the other end of the "jack" abutting against the last turned length of brickwork, enabling a sufficient resistance to be obtained to advance one, two and sometimes even three needles at a time.



Fig. 1.

The excavation was, of course, worked from the crown to the sides, and then, though the whole of the needles were being moved forward during the time this excavation was in progress, those at the crown were always the most advanced until the operation was completed, which was when the needles had about a foot of bearing on the last length of brickwork. To support the needles while they were thus being advanced, temporary props were employed but, as soon as they had been got forward for the length required, timber "horse-heads," cut to the contour of the tunnel, were used; these "horse-heads" being supported first by raking props and afterwards, when the "top-sill" had been got into place, by props from this sill.

To prevent any sinking of the ground above where the needles were drawn forward on the previous length of brickwork, the outer ring of the tunnel arch beneath the needles was built by leaving out every alternate course of bricks, as in Figure 2, and when the needles had been drawn forward about 2′, fine Portland-cement concrete was rammed into the spaces thus formed and then, by means of a "screw-jack," was squeezed over the blocks of brickwork left between the openings, so that the roof of the tunnel became properly supported in its place. The needles were then advanced another 2′ and concrete again inserted, and so on, until the whole of the needles for that length were taken forward. These needles were only used for about 12′ on each side of the centre of the roof of the tunnel, the remainder of the excavation being supported by timber-bars and "poling-boards" in the usual way.

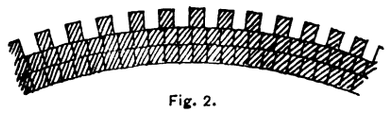


Fig. 2.

The King's Cross tunnel is very flat in its form, being 26′ across and 22′ in vertical height. Figure 3 gives a section of this and also shows from *a* to *b* the layer of needles forming the supporting roof over the excavation for the arch.

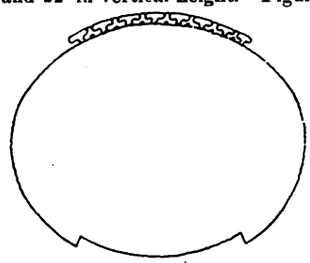


Fig. 3.

There is no doubt that if a tunnel is required to be driven through ground, where but little depth can be obtained above the tunnel arch, and especially where it is necessary to do away with all probability of the sinking of the ground, the use of these needles would be the best, both for safety and economy. The economy, especially, where the state of the ground requires timber, when used, to be built in, is clearly shown by the writer of the article in your January number already referred to.

In conclusion, I may say that Mr. Lovatt would, I am sure, be pleased to answer any question relating to the further employment of these needles, and also as to their supply for use in the United States of America. Yours very truly,

CHAS. PROUSE, A. M. Inst. C. E.

EXHIBITIONS

BOSTON, MASS. — *Several hundred Specimens of Textile Designs of all countries, from the second century to the present time, from the collection given by Denman W. Ross; also the Shirasu collection of Japanese Art:* at the Museum of Fine Arts.

CINCINNATI, O. — *Exhibition of the Cincinnati Art Club:* at the Art Museum, May 17 to June 30.

NEW YORK, N. Y. — *Twenty-sixth Annual Spring Exhibition:* at the Metropolitan Museum of Art, opened May 8.

Group Exhibition by American Painters — William M. Chase, J. Alden Weir, Childe Hassam and others: at the Galleries of the American Fine Arts Society, 215 West 57th Street.

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Notes and Clippings

Private Houses at Damascus. — If you can only judge from the outside of the house, you would say there was not one tolerable one in Damascus, but that would be a very wrong conclusion. You go up a filthy lane, holding your nose by the way and carefully picking your steps over all kinds of garbage. You knock at an old tumble-down door in a mud wall. You pass through it into a dirty, narrow corridor, and emerge into a beautiful court-yard paved with white and black marble and shaded by lovely orange and lemon trees. This court is bordered by splendid apartments. I say splendid, not tasteful nor comfortable in any way. Imagine a grand drawing-room, wainscoted with exquisitely carved marble, the execution of which must have cost $20,000, paved with costly tiles, a graceful marble fountain in the centre, and mirrors in frames of carved cedarwood all around. Stained windows shed a soft light on the costly furniture of mother-of-pearl. On the carved tables are coarse worsted flowers, such as you might see in a cabin in the pine forests of Michigan. On the walls are cheap, 25-cent engravings, and the rusty pipe of a common sheet-iron stove goes out of one of the fine windows. Gilding, but no taste; expense, but no beauty. And in came the mistress of all this gorgeousness, a fat woman badly dressed, and walking on pattens inlaid with mother-of-pearl, which raised her up to the height of a giantess and made her look so funny that it was with the greatest difficulty we kept from laughing; and when you go beyond the one or two show-rooms, you find nothing but ugliness and dirt. The domestic arrangements are often unspeakable, the sleeping-rooms comfortless, the kitchen and dining-room common and far from clean. The servants never undress themselves at night, but roll up in a rug and drop down anywhere, and the masters are not much better. They wear European clothes, but underneath there is no European cleanliness. We went to a bath-house to try a Turkish bath, but a regard for our skins sent us home again. We could not risk it. — *Clinton Locke in the N. Y. Evening Post.*

A Silesian Replica of the Tuileries. — At Paris the sale is about to take place of the superb Champs Elysées mansion of the infamous Countess of Henckel-Donnersmarck. It may be remembered that she was the daughter of a Pole, of the name of Lachmann; that at 16 she married a poor tailor at Moscow whom she deserted to come to Paris, where for a time her name figured on the registers of the police. I have related how she was driven out of the Tuileries by order of the Empress Eugènie after she had stolen into the palace in the guise of the wife of the pianist Herz; how, subsequently, she inveigled the Marquis de Paiva into marrying her, the nobleman blowing his brains out a few months afterward in the very house which is now to be sold; how she became first of all the *belle amie* and then the wife of the fabulously wealthy German nobleman, Count Henckel Donnersmarck, and how, after the overthrow of the imperial regime in France, she revenged herself upon the Empress by purchasing all her Majesty's favorite jewels and by getting Eugènie's own architect to construct for her in Silesia, a counterpart of that very Tuileries palace from which she had been so ignominiously chased. She is dead now, and her husband is married again to a very pretty Russian woman. Anxious, no doubt, to obliterate all memories of his first wife, he has given orders for the sale of this mansion, the principal feature of which is a staircase made entirely of onyx. The Countess had asked Edmond About to write a short dedication for this magnificent staircase, with the object of having his lines engraved in the fashion of the ancient Romans, upon the first step. The brilliant author, however, felt very bitterly at the time against this most famous of modern Phrynes, in consequence of some fancied or real slight to which he had been subjected by her, and while he complied with her request, the verses were not of a character that she cared to engrave upon her onyx staircase; for they began as follows: — Tout comme la Vertu, le Vice a ses degrés. — *Marquise de Fontenoy in the Philadelphia Press.*

Eastern Metal-work. — It is one of the unexplained mysteries of Asia that the achievements of its best metal-workers, so long as their work is useless, should be so completely beyond rivalry. We can understand this as regards the setting of precious stones, for, as we once said before, many years ago, the instinct of a Southern Asiatic living in painful sunlight is to blend the bright colors he works in till they do not hurt the eye. Consequently, the enameller of Jeypore, though he uses flakes of ruby and emerald, produces a surface which looks, even in sunlight, absolutely cool. But what helps him or a Japanese, or even a Turk, if a sultana has given the order, to make a gold or silver ornament which the West can only gaze at in defeated admiration, is still a problem not completely solved. The Asiatic does not know anything particular about gold and silver; he has no tools except pincers and a hammer; and he has not the power of producing intense heat; yet he will do things with the metals which his European brother cannot do with all his appliances and skill. No doubt, if he is an hereditary workman, something has passed into his fingers which cannot be acquired by a new competitor, and he has the advantage of remembering patterns originally designed by the men of genius, who are apt, at intervals perhaps of centuries, to crop up in the artist families. But is that the whole matter? We doubt it greatly, and believe that there is an Asiatic "taste," or instinct, for the beautiful, which is as true in its way as the instinct of an Athenian sculptor or Florentine wielder of the brush. — *The Spectator.*

Cui Bono? — But when he [Hamdi Bey] came to the tomb of Tabnit, king of Sidon, to which he penetrated with great toil and expense, passing down through chamber after chamber till he found the great stone covering the actual vault, which he hewed in pieces because it was too heavy to move, what did he find? A very simple black granite sarcophagus having no ornament whatever except on the lid, and containing the body of the king with a single fillet of gold round the forehead. There were hieroglyphics (verses from the Egyptian Book of the Dead) on the lid, but across the foot the following inscription in Phœnician: — "I, Tabnit, priest of Astarte and king of the Sidonians, son of Eshmunazar, priest of Astarte, and king of the Sidonians, am laid in this vault. I adjure whatever person may discover this vault, open not my sepulchral chamber and trouble me not, for there is here no silver, there is no gold, there is no treasure. Here I alone am laid in this vault. Open not this sepulchral chamber, for it is abominable before the face of Astarte. If thou openest this chamber and comest in to disturb me, mayest thou have neither posterity in the life beneath the sun, nor a resting-place among the dead." In spite of this pathetic appeal, not only was the whole stone coffin dragged off to Constantinople, but the body of the king was packed up in a tin box to be transferred to a glass case, besides the sarcophagus, where not only the skeleton but the very entrails are exposed to the gaze of the tourist! And to what purpose? Had even the mere lid been removed and the rest described and covered up again, we should have lost nothing; nay, rather, the cost in time and money of removing the huge stone cover and then the sarcophagus itself, might have produced, if properly applied, some evidence bearing upon the great series of artistic reliefs which are still unexplained — a great problem in the history of Greek and Phœnician art. — *Professor Mahaffy in the Nineteenth Century.*

A Peculiar London Railway-station. — A very queer railway-station in London is that at Wapping, on the East London Line. Very few dwellers in other parts of London ever get out at Wapping, and thus they miss the singular beauties of the station. Its appearance is that of a huge caisson for some engineering works to which winding staircases have been added. Up the sides of the huge caisson the passengers crawl like flies on a window pane. The secret of its queer appearance is that it was originally the northern shaft of the famous Thames Tunnel, which Brunel built in 1843 at a cost of £468,000 ($2,277,522). It was very dangerous work, owing to the porous nature of the river bed, and the tunnel was long considered a masterpiece of engineering. It consists of two arched ways of 1,200 ft. long, 14 ft. wide, 16½ ft. high, and 16 ft. below the river. For a long time it was a popular excursion to go through the tunnel; but it never was a financial success, and in 1865 the East London Railway bought it for £200,000 ($973,300), or less than half its cost. The company now leases its lines to a syndicate of other companies, who use the tunnel as means of communication between the southern and northern railway systems. — *American Engineering and Railroad Journal.*

A House of Glass. — In a recently published book, W. Vander Heyden of Yokohama, Japan, describes what he calls a newly devised sanitary building, an example of which has been actually built and lived in. Drawing somewhat upon imaginative writings seasoned with a dash of scientific truth as a warrant for his conclusions, Mr. Vander Heyden has had built a house of glass which he thinks should make life bearable alike in the coldest and warmest parts of the world. From a reviewer's summary it appears that the walls of the house are constructed of glass boxes made of two thick sheets fitted in a cast-iron frame, and the space between filled with a solution of alum. This solution is intended to separate the heat rays of the sun from the quicker vibrating rays known as light. These glass boxes are fitted closely together with felt between, and form four solid walls without doors or windows. Window frames are inserted between the two glass plates and form air-spaces. The ceiling is made of double glass, covered with a thick layer of ashes, and the sloping wooden roof above this, is covered with cement. The floor is of double planks saturated with parrafine, with sawdust between. Access is through the floor by an underground room of brick or iron plates. All the air entering the house is filtered and artificially warmed. A test house on these conditions was built one year, and, during the winter, the interior temperature differed only three and one-half per cent between day and night. — *Providence Journal.*

The World's Fair Hotels filling up. — Such a moving as is taking place this week in Chicago! North and south and west, may be seen processions of furniture-vans loaded with the effects of thousands of families. Landlords who raised the rent of their buildings to the highest notch when the World's Fair was in view are now reaping the results of their avarice. The North Side is losing the most. The movement of the people is toward the West Side and the World's Fair district. The majority of the people who go to the World's Fair district have stored their furniture and are taking furnished flats in the big hotels and apartment-houses. After the Exposition many of the big houses shut down rather than pay coal bills during a long winter. Several of these buildings, however, were transformed into family hotels, and they are now receiving the benefit of an early start. Great inducements are made to get persons to move to this section, such as free storage for furniture, $25 per month for three or four furnished rooms, and all the conveniences of hotel-life thrown in. — *Chicago Tribune.*

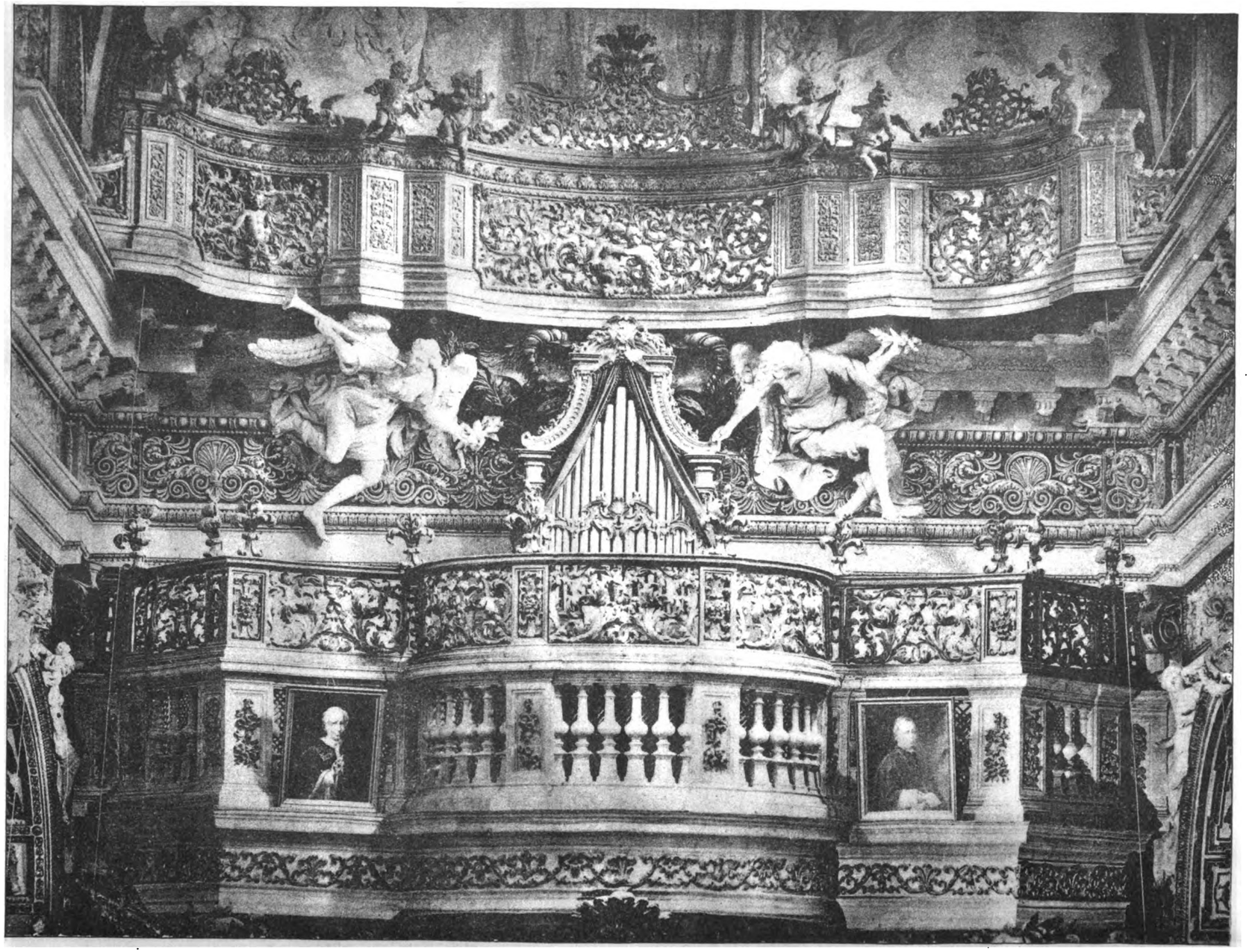
Leo protected by Flora. — In crossing a public square at Stockholm, says Professor Morse, in company with Dr. Hilderbrand, the royal antiquarian who had under his charge all the public monuments of the kingdom, he called my attention to some bronze lions at the base of a monument, stating that for some time he was perplexed as to the methods that should be employed to prevent the children from riding on the backs of the lions. This innocent enjoyment would not have been interfered with had it not resulted in adding an unnecessary lustre to the backs of these figures. It was absurd to place a policeman on guard, and it was a confession of weakness to fence in these works of art. Finally, taking advantage of the love of flowers possessed by the Swedes, he had laid out around the statue some flower beds, and not a child would mar these beds even for the delight of a ride on the lions' backs, and the patina which had been rubbed off began to form again.

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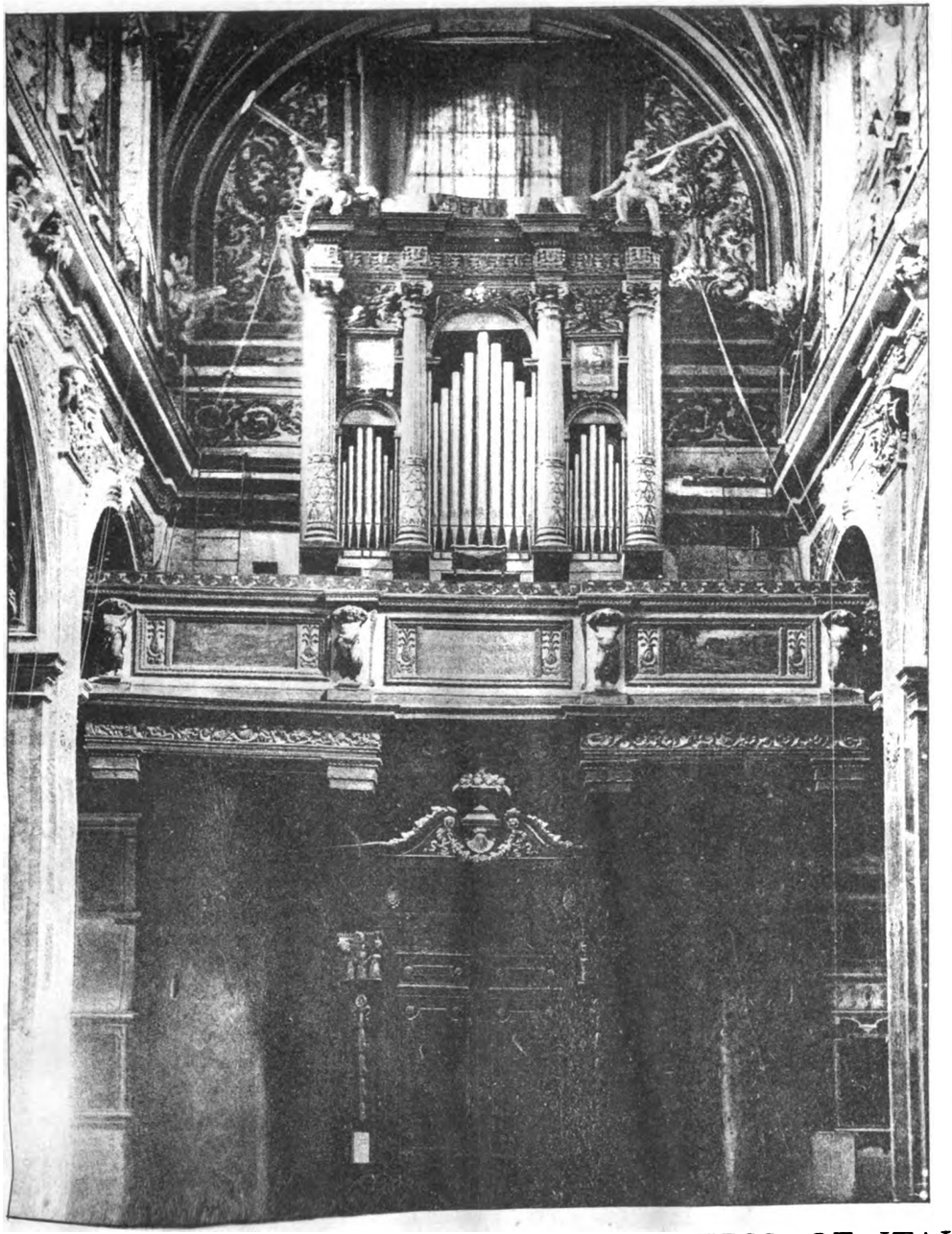
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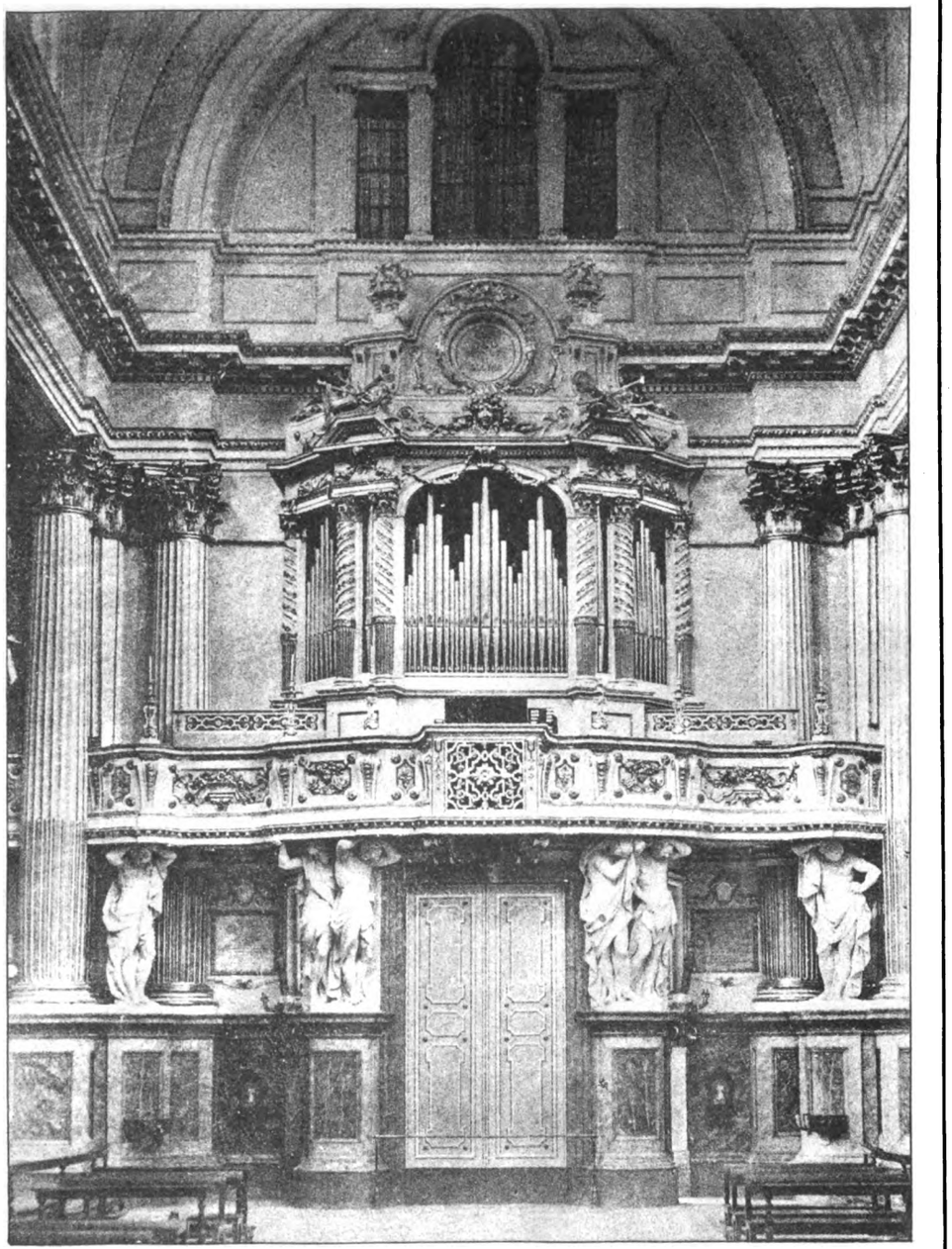
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2. A TRIO OF ITALIAN ORGANS. 3.

1. S. MARIA DELLA VITTORIA, ROME: 2. UNKNOWN: 3. CHURCH OF THE SERVITES, RIMINI.

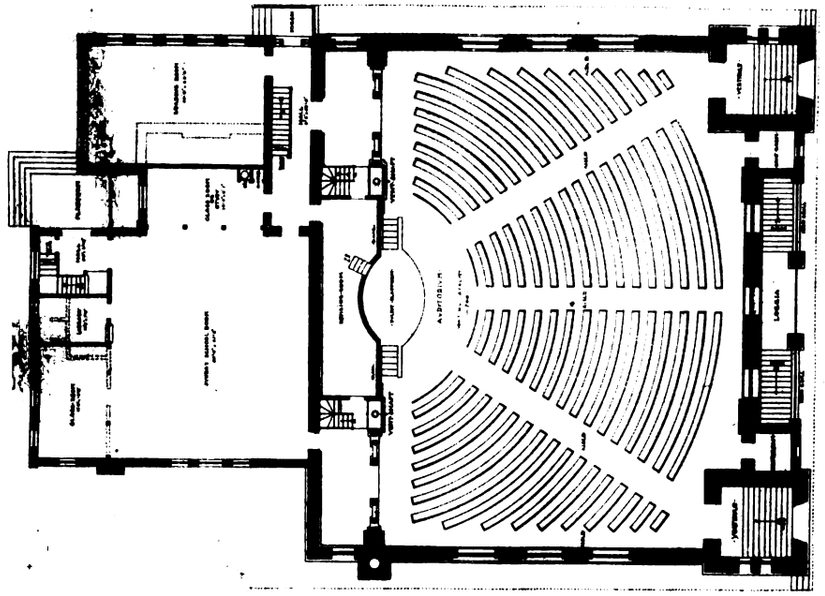
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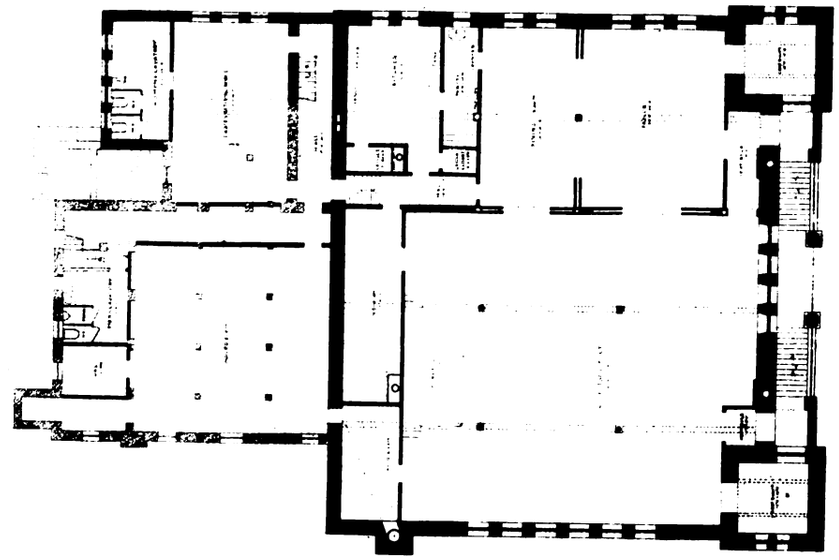
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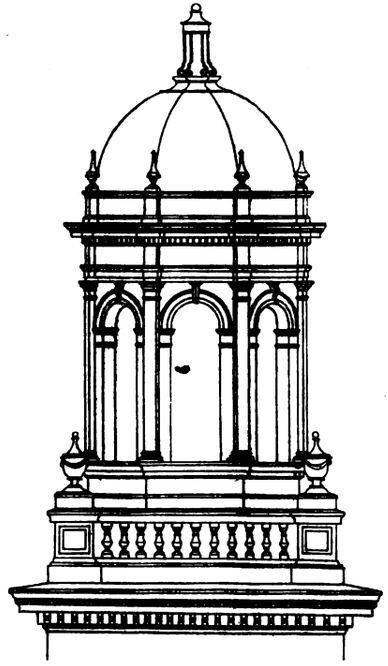
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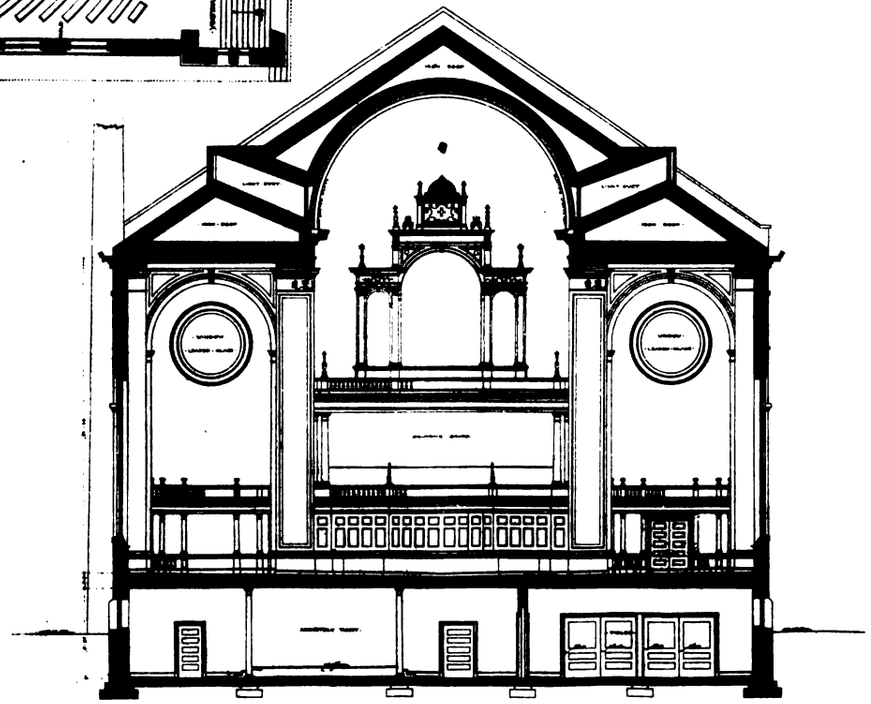


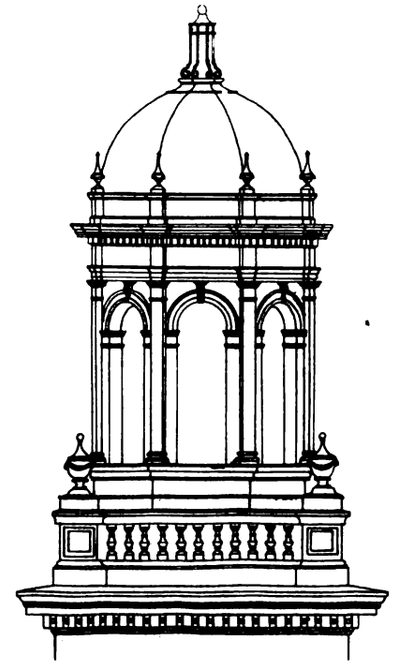
FLOOR PLAN.

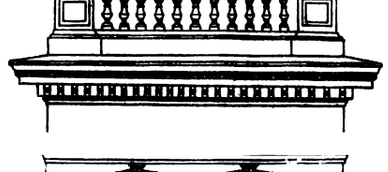


BASEMENT PLAN.

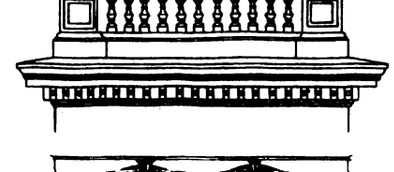




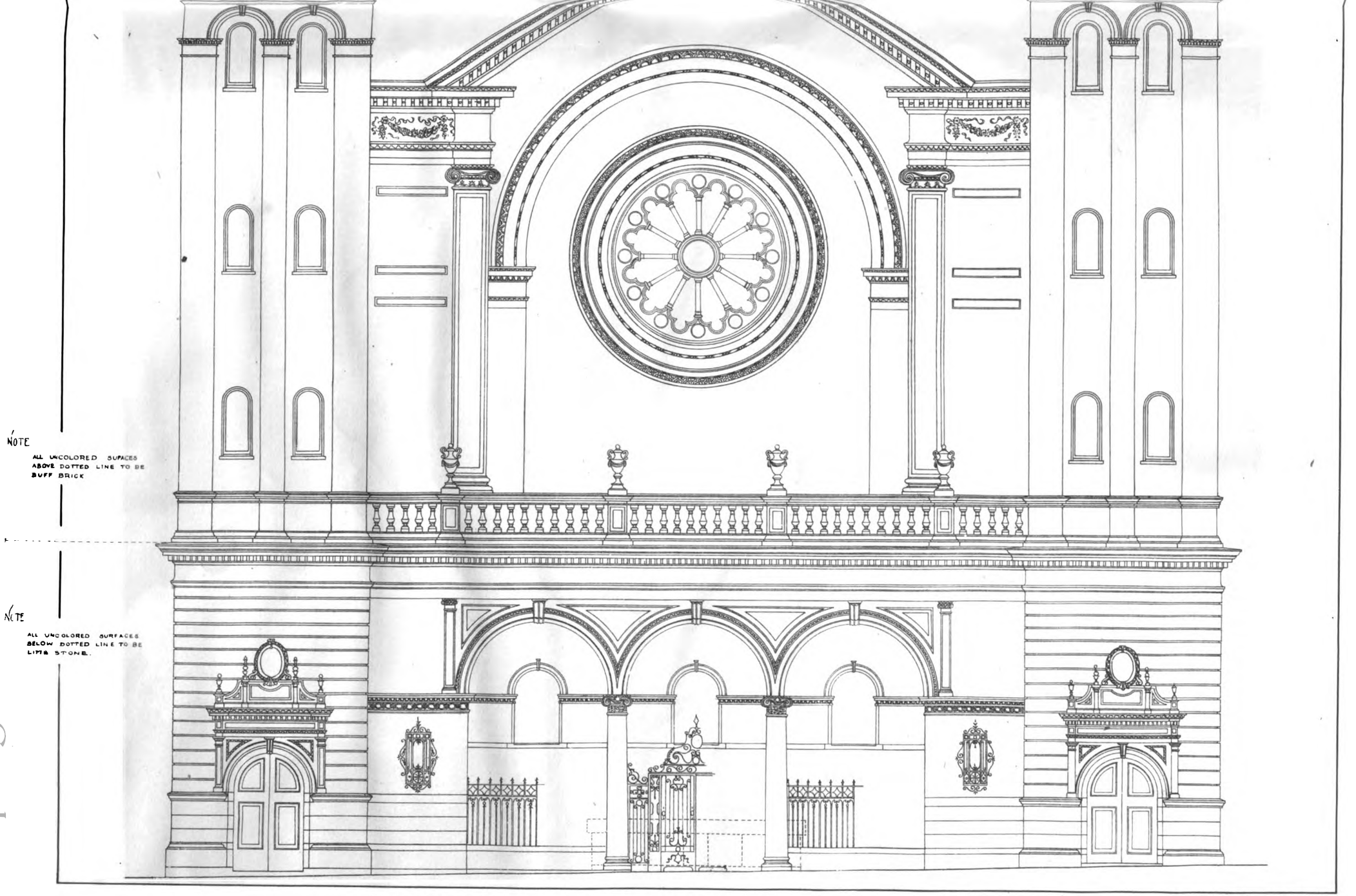








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ACCEPTED DESIGN FOR FIRST PRESBYTERIAN CHURCH, ELM STREET, NEW HAVEN, CONN.

F. R. COMSTOCK, Architect.

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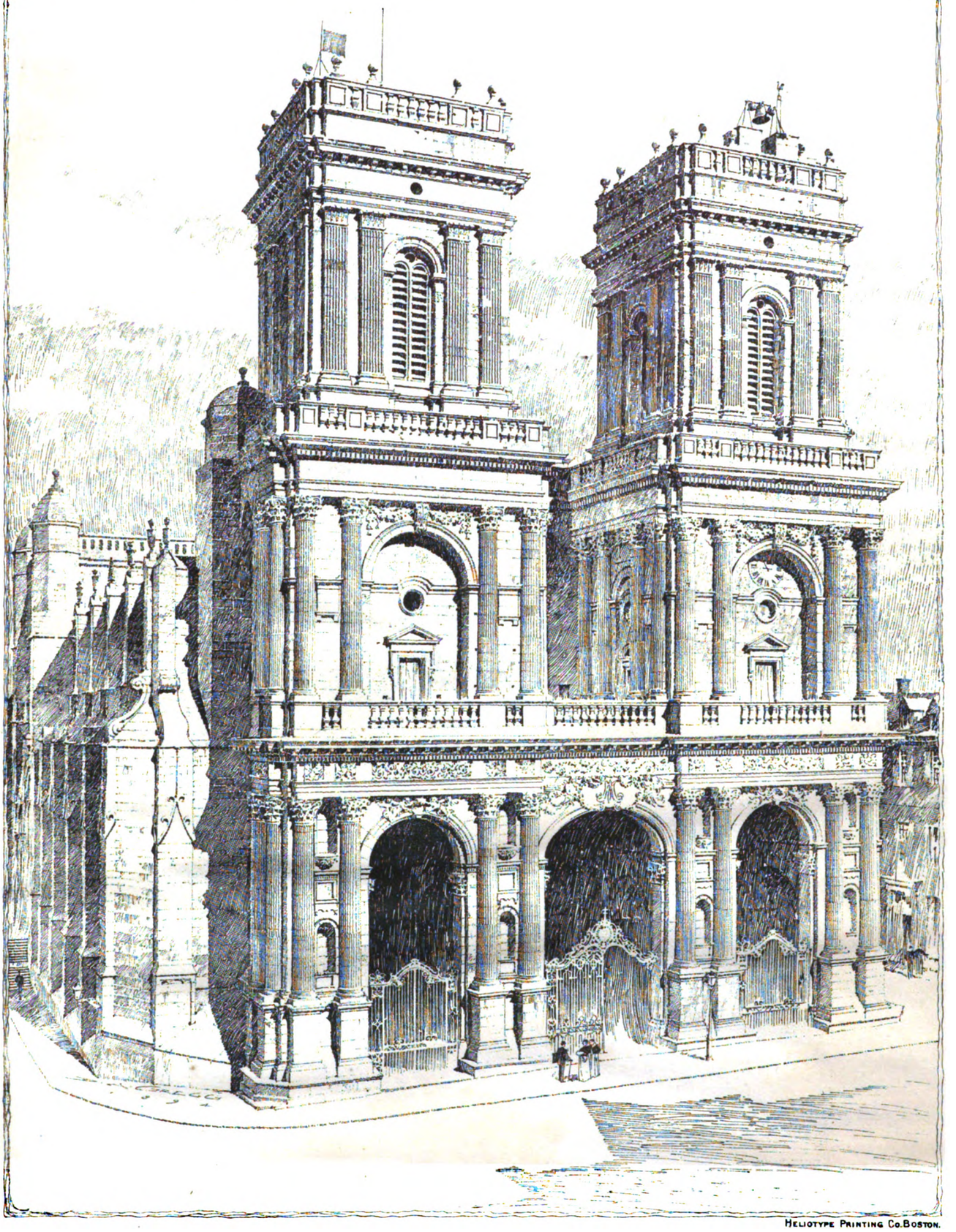
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CATHEDRAL AT AUCH, FRANCE.

NAVE AND TRANSEPT BEGUN, A.D. 1489. COMPLETED A.D. 1548

TOWERS ---- COMPLETED A.D. 1685.



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View of Mr. J. Levering Jones' House, Chestnut Hill, Philadelphia.

Geo. T. Pearson, Architect, Phila'a.

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JUNE 23, 1894.

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ACCORDING to the Philadelphia *Press*, there are signs of movement in the tower of the Philadelphia City Building, and work has been suspended on the upper portion until the substructure can be strengthened. It will be remembered that this tower was originally intended to be the highest structure in the world. Since the design was made, however, its proposed height has been far surpassed by the Eiffel Tower, and, when the building is completed, it will probably hold only the third or fourth rank among high structures. However, a tower five hundred feet high is, in any case, a rather serious matter of construction, and it is not surprising that difficulties have been encountered. According to Mr. Powell, the newly-appointed architect of the building, who seems to have been the first to discover the movement, and point out the true cause, the foundation and first story of the tower were well built, of perhaps sufficient thickness, with brickwork in cement. Above the first story, for some unexplained reason, the walls, although about six feet thick, were built, for several stories, with lime mortar, with a facing of marble ashlar, twelve inches thick. Above the fifth story, the builder seems to have recovered his senses, or the architect to have realized what was going on, for thenceforth the brickwork was laid in cement. As the weight on the masonry increased, the natural result took place. The walls of the first story and basement, being laid in cement, kept their place, Mr. Powell having found no trace of settlement subsequent to the hardening of the cement. Where the brickwork was laid in lime, however, there has, of course, been no hardening. The mortar in the interior of the walls is still soft, and the compression of the joints, added to the shrinkage from evaporation, has not only caused serious settlement, but, by bringing the pressure on the thin, but almost incompressible marble ashlar, has crushed and split this to a rather alarming extent. Mr. Powell has arranged to fill up some of the arches in the lower part of the tower, and in other ways distribute and equalize the weights, and, as we gather from the newspaper account, to reinforce the masonry in lime with proper brickwork in cement; and it is much to be hoped that his efforts to stop further mischief will be successful. It will be remembered that considerable repairs on the lower portions of this tower had to be carried out nearly ten years ago, owing to carelessness of very similar character on the part of workmen or architect. At that time a considerable portion of carved and polished stonework had to be replaced because it had been cracked and crushed through the unequal settlement between the brick filling and the facing, the joints of the latter not having been laid slack enough to allow for the greater compressibility of the brick-work filling. Accidents of this kind are not so uncommon that their causes and remedies are not known to every one, and yet there are architects and workmen whose love for a close, neat joint in stonework is such, that they make use of it at the risk of having to make costly repairs later, such as these at Philadelphia or those demanded by a similar mishap at the State-house at Hartford.

AMONG the proceedings of the Convention of the National Association of Builders, referred to last week, none seem to have been more interesting than those relating to arbitration. The discussion on this point was introduced by the delivery of an address by Hon. Carroll D. Wright, United States Commissioner of the Department of Labor, on "The Relations of Employer and Workman." We hope to print this admirable little address in full later, and will not anticipate it here, except to say that we have never seen the distinction between the paralyzing tendency of State, or compulsory, socialism, and the great and vivifying principle of ethical altruism so forcibly presented. It is gratifying to find that the discourse was received with the deepest interest and satisfaction, and the conversation which followed, on the practical methods of adjusting labor questions in use in various localities, showed that the master-builders are by no means insensible to what Mr. Wright calls the modern tendency to think of other people's rights and wishes, as well as one's own. Next to this, the most interesting discussion was that on the Uniform Contract. As might be expected, a great deal of the talking was done by builders, who had had some personal misunderstandings with architects or owners, and wanted clauses added to the Uniform Contract to cover such cases; but the Contract Committee seems to have stood up firmly and successfully against confusing its form by the addition of provisions which any court of law would hold to be implied in what was already stipulated. One grief of the builders seems, however, to have been a real one. In one case, where the contract included the furnishing and decoration of some steam radiators, the radiators were to be picked out with gold. Naturally, this decoration was applied after the radiators were set, and the member who made the complaint said that the architect refused to accept the work as satisfactory, because the gold was not applied between the pipes. He did not say how the gold was to be got in there, but, as was alleged, the owner took advantage of the architect's refusal to accept the decoration of the radiators to withhold a thousand dollars of the contract price. The contractor applied to have the matter arbitrated, but, according to the story, the architect replied that there was no provision in the contract for arbitration of such matters; so that the contractor was still waiting for his money.

SUPPOSING this statement of facts to be correct, the obvious remedy would be, not, as one member suggested, to have another arbitration clause incorporated in the Uniform Contract, covering all sorts of disputes, but to bring the case at once into court, on the ground of fraud and collusion on the part of the architect in withholding his certificate of satisfaction. It is well-established law that, although a contractor may have agreed to be bound by the decision or opinion of the architect, he is freed from his agreement by fraudulent conduct on the architect's part; and, if a jury or referee finds that the architect has been wantonly unreasonable or dishonest in his decision, or has given it in collusion with the owner, with unfair intention, the contractor will no longer be bound by it. As we have often had occasion to say, an arbitration is the least satisfactory, and often the most expensive form of lawsuit, and should be avoided by every possible means. As a rule, the architect knows more about the matters in question than any one else; he is generally honest and impartial, and he does not have to be paid a large slice out of the amount in controversy for rendering his decision; so that anything that can be left to his judgment should be so left, in the interest of all parties; and if, occasionally, an architect stoops to pervert his decision to aid some scheme of fraud or oppression, a sharp reminder from a civil or criminal court will be found more efficacious in correcting such abuses than the

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abandonment of the whole system of reliance on the architect's honesty, and a return to the inconveniences and disappointments of multiplied arbitrations.

A CASE just decided in New York in regard to the relative positions of the unincorporated labor unions, and the walking-delegates, by whom they are often annoyed, has been reported in some of the daily papers in a way to lead to misapprehension. The Board of Walking-Delegates of the Building Trades has recently fallen foul of the Progressive Painters' Union, and has interfered with the members of this body, procuring their discharge from employment by the familiar means of coercion, threatening, and otherwise annoying them. The President and Treasurer of the Painters' Union applied for an injunction to restrain the Board of Walking-Delegates from such proceedings, but the Supreme Court decided that they were not entitled to an injunction; not, however, as the papers seem to think, because the Court was unwilling to interfere with the antics of walking-delegates, but on the ground that, the Progressive Painters' Union not being incorporated, it had, as a body, no legal standing, and its officers no power to represent it in attempting to right the wrongs of its members. If the Union, though unincorporated, had carried on a business enterprise, its members might have been regarded as partners, and one might have been admitted to speak for the rest; but, as Judge Barrett said, it was simply "a brotherhood with fraternal aims," but no capital or common business, and could not therefore aspire to corporate rights. If any individual member, who had been discharged on account of the threats of the walking-delegates, had brought suit for redress, or for an injunction, in his own name, he would, in all probability, have gained what he asked; and the decision simply points out that this is the proper course to follow in such cases. If the other members of the Union wish to contribute, afterwards, to pay the legal expenses incurred in prosecuting their brother member's case, there is certainly no objection to their doing so.

MR. A. T. BOLTON recently read before the London Architectural Association a paper on "The Practical Side of Travelling," which contains many valuable suggestions for the student of architecture abroad. As a rule, Americans, particularly young men, travel in foreign countries more easily, and with more satisfaction to themselves, than people of any other nation. It is true that they are very much hampered by the want of acquaintance with foreign languages, which is the result of a school system in which modern languages find practically no place; but they soon pick up something of the language of the countries through which they wander, and are not bashful about making use of what few words they know; while in other respects they accommodate themselves with peculiar readiness to the customs of the place of their sojourn, much to their own comfort and advantage. It is almost a proverb that an American is equally at home in almost any business, and the idea which observation impresses on a young man here, that, if he gets tired of being an architect, or business is dull, he may find an opening in cotton manufacture, or the sale of tinware, or may fall back on a ranch in Nebraska, undoubtedly accustoms him to the feeling that he must keep himself prepared for changes, and not allow himself to fall into ruts of working and thinking. This habit of mind has great virtue in adapting one to the varying circumstances of foreign travel, and the American student lunches on sour bread and corned beef in England, or soup in France, or vegetable salad in Germany or Italy, or black bread and goat's-milk cheese in Switzerland, with equal enjoyment, and does not hesitate to leave the beaten paths of travel through fear of not getting beefsteak every morning for breakfast.

ACCORDING to Mr. Bolton, who will be supported by every experienced traveller, the first thing necessary, before starting on a Continental tour, is to study the subject beforehand, plan one's route, make up one's mind what things to see, and to collect information as to those things. Such information cannot well be collected on the journey, and without a well-planned scheme of the intended tour one is sure to waste much time and money in aimless wandering, which brings very slight returns. Next to the plan of the journey, a good guide-book is the most important requisite. Mr. Bolton thinks that Murray's is the best for Spain, Hachette for France, and Baedeker for Italy, to which may be added Switzerland and Germany. In regard to the vexed question, whether it is best to go as quickly as possible to the most remote point of the proposed journey, and return slowly, sketching on the way, Mr. Bolton thinks that, unless the season is unfavorable, it is an advantage to begin sketching with the work near home, and thus find one's self, on arrival at the remoter and perhaps more interesting districts, equipped, not only with a valuable appreciation of the transitions between the more and the less familiar styles, but a greatly increased power of sketching effectively, correctly and rapidly. Every travelled student finds that one improves in sketching almost from day to day, and it is certainly desirable to be able to devote the best skill and most rapid execution to the work which presents most interest. Whether to travel in company or not is another doubtful question; but the travelling-companion of a student of architecture should also be an architect, and an amiable one too, or each will be better off alone. Mr. Bolton says that a travelling-companion is a hindrance to learning the language of the countries visited, and so he is, if he insists on talking his own language; but if both parties know a little of a foreign language, and make up their minds conscientiously to learn more, they can have excellent practice in talking to each other; and a solitary student in foreign parts, particularly a young one, must be pretty strong-minded not to have occasional hours of loneliness and discouragement. We may, later, find space for portions of Mr. Bolton's paper, which will be interesting to those architects who have made the Continental tour, and useful to those who hope to make it.

IT is very curious that, France being the most conservative of the great nations, the French much preferring to live at home, and look out for their own affairs, instead of sending out colonies, and attempting to regulate the affairs of other people, while England is the most enterprising in the way of foreign adventure, it has for some years been the French who have steadily advocated the construction of a tunnel or bridge across the English Channel, while the English have hung back, made difficulties and objections, and successfully opposed the carrying-out of any project of the kind. Some people will have it that the English are afraid that a company of French infantry might cross the bridge as passengers, seize the British end, and hold it open until the entire French army had crossed, slaked in Anglo-Saxon blood its thirst for revenge for Waterloo, and returned safely home; but military operations are no longer carried on in that fashion, and France, if she meditated the wholesale drinking of British blood, could secure that satisfaction much more cheaply by sending off, during a southerly wind, a lot of balloons, carrying dynamite bombs with long fuses, than by helping to build a bridge or a railway tunnel. Just now, the successful operation of the London tunnel railway by electricity has reopened the matter, and a petition has been favorably reported in the French Chamber of Deputies, asking that diplomatic negotiations may be resumed with England, with relation to the construction of a double tunnel across the Straits of Dover, through which trains of cars can be drawn by electric locomotives. It is proposed to make the tunnels of steel tubes, with double walls, filled-in with concrete. The tubes would be put together in sections, three hundred feet long, with closed ends, which would be towed to their destination, sunk by weighting, and attached to the preceding sections. The bottom of the channel between Dover and Calais is nearly level, so that the condition would be very favorable; and it is estimated that the work could be done for about seventy-five million dollars.

THE death of Birdsill Holly, the inventor of the system of water-supply called by his name, has given occasion for many obituary notices in the daily papers, some of which recall a certain inscription on a tomb-stone, which ended with the information that the business was continued by the widow at the old stand. Nevertheless, the Holly system, under which the cost of a reservoir is saved, and pressure obtained by pumping directly into the mains, has served a very useful purpose in small towns, and is likely to be applied in many more before it is superseded by a better one. Mr. Holly was a clever inventor and mechanic, and deserves a high place among the ingenious Americans who have helped to make the name of their country famous in the industrial world.

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FRENCH STYLES OF ARCHITECTURE. — I.

AN HISTORICAL SKETCH.

THE æsthetical, philosophical or even physiological questions that may arise in a discussion bearing on the significance or force of the word *style*, viewed as characteristic of a work of art — aside from any chronological, historical or geographical consideration — constituted the subject matter of the preceding article entitled STYLE. The present article is simply a critical treatise on what, by common consent, we denominate, whether correctly or incorrectly, *French Styles*. This term is applied in ordinary parlance and among amateurs and artists, in France as well as abroad, to the well-determined features, the wholly characteristic forms of those productions of French art that have come down to us from the last two centuries, from the epochs corresponding to the reigns of "the Louis" — Louis XIII, Louis XIV, Louis XV and Louis XVI.

After the imitations, the innovations or brilliant revivals, the enthusiasm and the exuberance of the French Renaissance; after the extinction of the Valois family and the abatement of the religious excitement, came a severe reaction in French art, when it endeavored to free itself from all too immediate foreign influence — or, at least, from Italian ascendency. Having cast off its Italian vestments, and stiff at first even to crudeness and awkwardness, it was somewhat impoverished; but no sooner was it fully delivered from the bondage to ultramontane fashion than it recovered its freedom of movement and found a basis of honesty and sincerity, which was destined to become nobility. Under Henri IV and Louis XIII, it made its way seriously, clumsily, but surely, toward that sudden radiant development of the age of Louis XIV. Softening down the too rustic austerity of the Louis XIII style, the Louis XIV maintained its proud and noble bearing — becoming stately, it may be, but not pompous — perfected its proportions and rendered its forms flexible.

Toward the end of the seventeenth century, French art attained what it has never been possible to attain outside of France, and perhaps outside of Paris, namely, an imposing or pleasing simplicity and a freedom full of suppleness; a perfect serenity, an absolute calm? Is not power determined by these characteristics? Decorative, monumental in the highest degree, but without picturesque touches, it bears the stamp of a unity and of such conciseness that, to ordinary eyes, the art disappears, leaving only an impression of a work produced as a matter of course. And, as is the case with every natural production, it would be impossible to lop off the slightest detail from any artistic bit belonging to this period without disarranging the motive or the *ensemble*, and without destroying in the motive or *ensemble* the very clear significance that appeared before the mutilation.

This absolute unity which brings the work of art so near to the work of nature, is encountered only at the noblest periods; that is to say, in Greek or Roman antiquity; in the eleventh and thirteenth centuries of the Middle Ages; and lastly, in the time of Louis XIV and of Louis XV.

The Renaissance, in France as in Italy, witnessed the budding and flowering of a charming art, an art full of surprises, admirably delicate in the carving of its infinite ornamental details; full of *verve* and poetry animated from earnest delvings amid the remains of Classic antiquity. But there was a somewhat giddy infatuation at first in France for the Italian fashion. Artists chiselled and embroidered in traditional forms, on the old Gothic body, all that could be borrowed from antique monuments, or oftenest, from the Italian Renaissance decoration. On this enrichment of the dying Gothic, were employed at the same time the French *tailleur* and the Italian carver. The chisel of the first, accustomed to the rankness and profusion of the Savoy cabbage or succory, is easily recognized, from the dawn of the French Renaissance, at Gaillon as at Azay, in Auvergne as in Brittany.

In the north and south, in the east and west, on the banks of the Loire as on the Place de Grève, the Italian was frequently seen side by side with the Frenchman on the scaffoldings; they worked together on the scabbling, each stone having been designated in advance by the master-workman for the

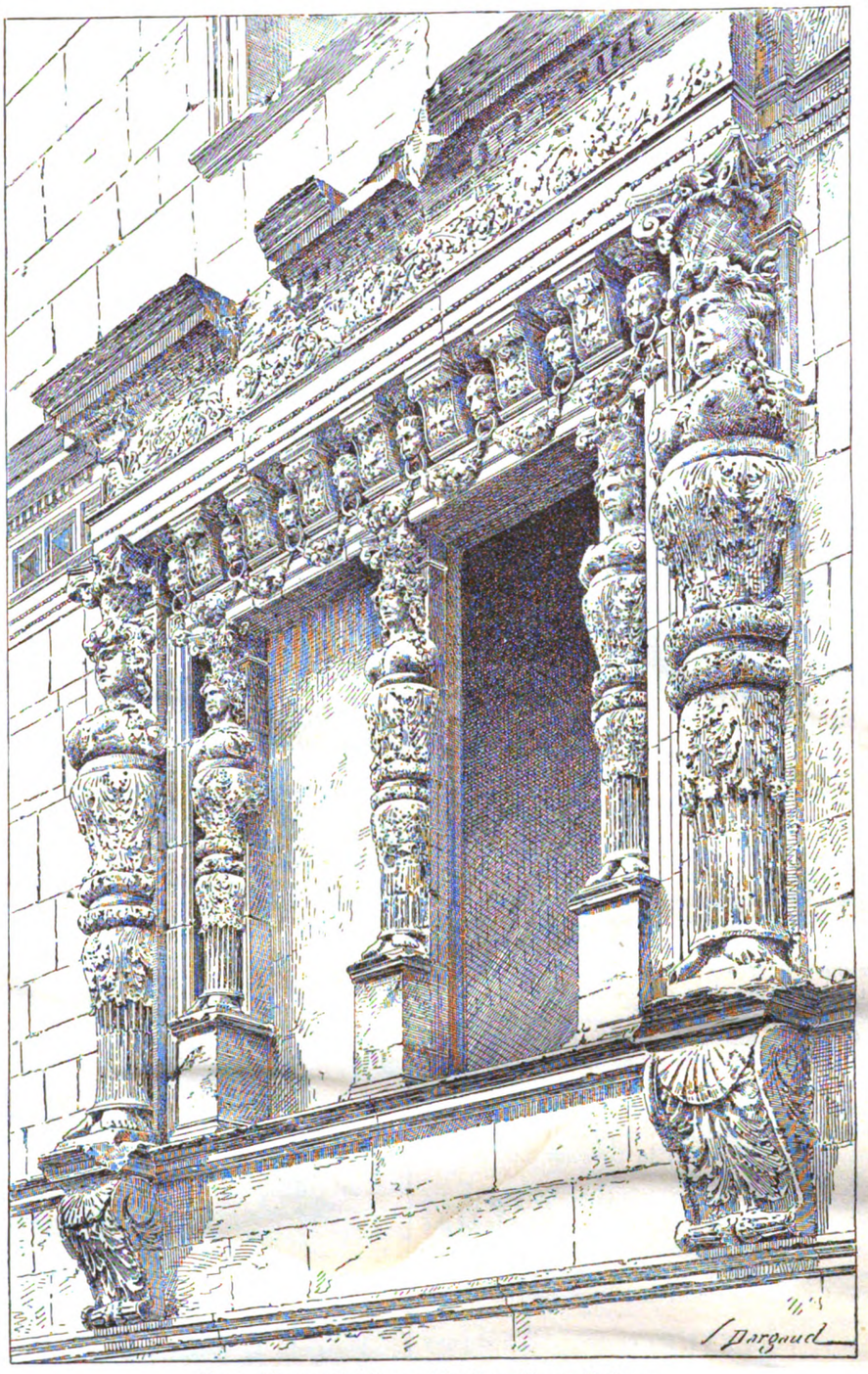


Fig. 1. The so-called House of the Three Nurses, Narbonne.

[1] From the French of E. Rivoalen, in Planat's *Encyclopédie de l'Architecture et de la Construction.*

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refinements of a wholly conventional arabesque, for flat chiselling, very finely shaded by the Milanese or the Florentine; or for vigorous reliefs, for the strong shadows of a deep-cut, robust ornamentation, for elements derived from the local flora richly diffused, in a Gallic fashion and very cleverly, by the *tailleur* from Touraine or Normandy, Burgundy or Paris.

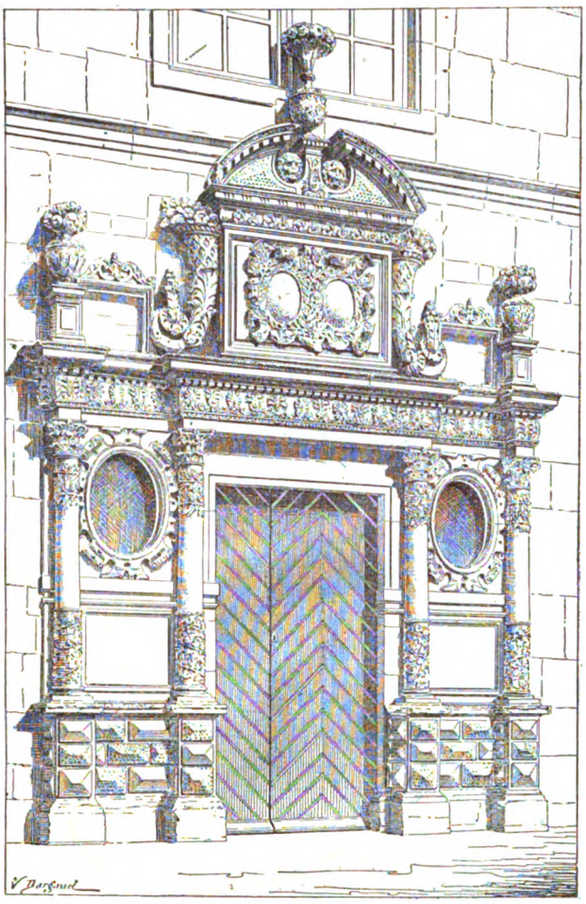


Fig. 2. Doorway of a Mansion at Langres.

Then, little by little, less use was found for the Italian artist or workman in France, in the revival of an art whose teachings our old masters, like Lescot, Bullant and Delorme, went in search of and whose principles they studied at Rome, on the very site of its ancient glory and in ruins that had already been exploited by the masters of Italy. The French *tailleurs* gradually gained the skill and deftness in handling the chisel and the knowledge of shadows which the Italians exhibited. And thus, after Gothic forms and combinations had been abandoned, the French Renaissance was an accomplished fact.

A glance at the artistic transformations of the time of Louis XV and Louis XVI shows decorative art, from the Regency, becoming "sensualized" in increasingly supple, ample, disguising, clever and coquettish forms, and in tiresome but always gracefully turned details.

It is a charming art, wholly French and inimitable in Berlin as in Madrid, in Vienna as in London. A careful study of the illustrations accompanying the different articles on the Architecture of Germany, England, Austria, Spain, the Low Countries, etc., would make other evidence in support of this statement quite unnecessary.

During the reign of Louis XVI, art became thin and puny in its excessive delicacy — that art which a sudden reaction, in the declining days of the preceding king and when the "rocaille" was disappearing, had brought back toward a conventional "antique" or rather toward a Neo-Louis XIV, which soon lost in amplitude.

Then followed the Empire, which inherited, over the Revolution, this artistic bloodlessness. By a direct imitation, almost naïve and as cold as it was sincere, of the "antique" sentiment, the art of the Empire became stiff, even angular and brittle — if not ridiculous. To begin with, it was still French, still supple in its elegant and coquettish poverty; the Revolutionary storms had narrowed it, without blotting out its traditions.

The Renaissance and the Louis XV and Louis XVI styles produced some marvellous works in architecture and monumental sculpture. The Louis XIII period witnessed the introduction of a much needed sobriety after the costly graces of the sixteenth century. The art of these periods was charming or severe, but either too trifling or too heavy, and never attained to the grandeur, the nobility, the absolute unity displayed under Louis XIV, in an architecture which is doubtless cold to the ordinary observer, but is judiciously embellished, in chosen spots, with a quiet, monumental sculpture, inseparable from its support, to which it gives the coloring note, the brilliant point, and whose harmony it perfects.

We have already discussed systematically and conscientiously the individual styles and the masterpieces of the various periods of French art — Romanesque, Gothic, Renaissance, etc. Not only the distinctive and general characteristics of the art at each epoch, but also the varieties of schools, classified by nations and provinces, have been carefully noted. Without trenching upon these articles, it is at least of interest for us to observe here the diversity, so far as France is concerned, in the Renaissance productions of the different provinces. There is still something of that variety of local schools which we wonder at in the Gothic period.

Nothing, in fact, resembles less the Renaissance of Jean Goujon, the "Parisian," or of the Abbé de Clagny (Lescot) than the hearty, wanton, picturesque profusion of the window in a house at Narbonne (Fig. 1), termed, with some show of appropriateness, "the House of the three Nurses." The robust and rich fancy, the caryatides and their gaines profiled as balusters and adorned with the acanthus — all is, indeed, from the brain and hand of a Frenchman, inheriting the spirited manner of the Middle Ages, but who knew well how to manage the profile in the Italian or the antique fashion — whichever you will; who clothed the *orders* in a costume savoring a trifle of the carnival, but executed in a sinewy and clever manner; who was never for a moment unmindful of the effect; and who comprehended no architecture, however refined, without *diamond points*. It is, in a word, a bit of the decadent school of Bachelier whose centre of production was at Toulouse.

Doubtless the disciple had, like the master, seen Italy; he had been but little imbued with the beauties of proportions, with the cold elegance of ancient art; imitating the Italians, he maintained delicacy in his profiles, that precious possession of the French artists of the sixteenth century who studied at Rome. He delighted, especially, in strong projections, in the picturesque effects of Venetian palaces.

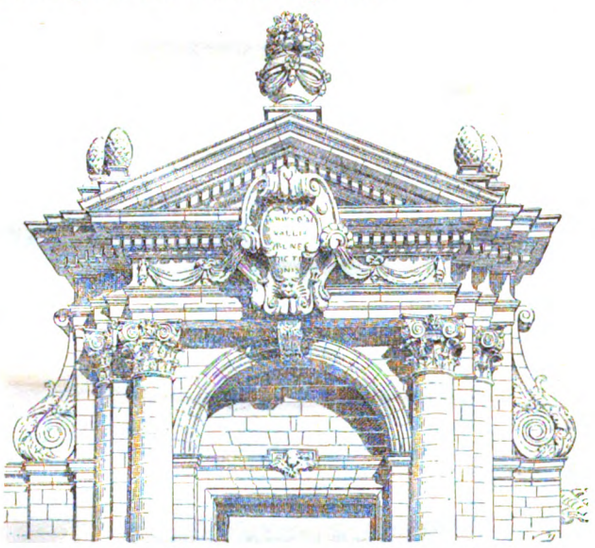


Fig. 3. Door of the Carthusian Convent, Villeneuve-lès-Avignon.

Again, does not the door (Fig. 2) of a private mansion at Langres (Haute Marne) show how much the Burgundian school, to which — with its Flemish touch — this specimen probably belongs, differed from those of the South. Here, a truly architectonic disposition, under the influence of the School of Ile-de-France, is enriched with an ornamentation, less finely shaded,

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less Italian, it is true, than that of the southern school, but also much better subordinated to the lines, the projections, and the general expression of the architectural motive. The decorative embroidery is not chiselled here; and the *color* is everywhere equally diffused or nearly so. The decoration is executed somewhat as though with a punch. It is not in bronze with cleverly shaded niceties, after the Italian manner; it is stone, cut by French *tailleurs* subject to the will and the inspirations of the master-workman, of the architect. The profiles are of a really wonderful delicacy of design. The blank of the wall sets off the wealth of the sculptured parts.

The architecture of the seventeenth century, as we have said, sometimes admits of a rustic simplicity, enlivened only by the silhouette of the stone courses of the frames or angles which stand out on a background of brick or colored materials; sometimes of a Classic disposition for edifices permitting a certain degree of luxury, and which is based on the precepts — henceforth followed as gospel truths — of Vignola, Palladio



Fig. 4. Door of the Old Sorbonne.

and Scamozzi. The French artists went to Rome when quite young, to complete their studies. They came back with their eyes trained to the fine proportions of the Roman palaces, and to the stateliness of the doors or portals of the villas or "vignes," belonging to the princes of the church. It is thus that La Valfenière (François II) — one of the dynasty of architects who have left at Avignon and Lyons many traces of their passage, and to whom was entrusted the enlarging and decorating of the Carthusian Convent at Villeneuve-lès-Avignon — built about 1636, the beautiful door shown in Figure 3; the majestic disposition, the entire soberness of the decoration, and the strength of the projections, transport us indeed to the Eternal City. On the splendid escutcheon, bringing together and securing the architectural members and relieving the structure of all stiffness in the Classic correctness of the crowning, we seem to see the pills of the armorial bearings of the Medici family.

Did not Cardinal Barberini, who was received in pomp at Avignon in 1625, and for whose entrance La Valfenière had designed the city decorations, did not this Roman prelate, this extraordinarily intelligent amateur, have an influence, by his encouragement and counsel, on this French architect's ampleness of style?

At this time Le Mercier and Le Muet were among the wisest and most judicious handlers of architectural dispositions. The first, especially, at the Louvre, at Richelieu's Sorbonne, a door of which is given in Figure 4, at the Palais-Cardinal (Palais Royal) — where but little remains from him — at the Château of Rueil (for Richelieu) at Versailles and finally at Richelieu in Poitou (city and "magnificque" château of Richelieu) has exhibited such a diversity of talent, according to the circumstances, such correctness in his dispositions and such judgment in suiting all to the importance and destiny of each edifice, that with Sauval we do not hesitate to rank him as a master, as the worthy forerunner of Perrault and of Jules Hardouin Mansart.

The door of the Sorbonne (Fig. 4) with its broad cartouche occupying the entire impost, richly carved and modelled and not devoid of delicacy; with its broad double frames; its bold reliefs announcing the approach of the Louis XIV style; its intertwined palm branches savoring still of the finicalness of the Renaissance; with its plain frames and its rustic basement — this wooden portal is, like the door of the Carthusian Convent at Avignon, a superb type of the transitional art leading from the heavy style of Henri IV and from the style of Louis XIII — which is too severe or too elaborate, sometimes melancholy when it is not grotesque — to the frequently cold but always noble breadth of the style of Louis XIV.

[To be continued.]

THE ESSENTIAL CONDITIONS OF SAFETY IN THEATRES.[1] — I.

THE subject of the causes and prevention of fires in theatres has since many years, occupied my special attention. Having been engaged in the course of my professional practice with the installation of water, gas and fire service plants in some of the modern theatres, I have had special opportunities of becoming familiar with the essential requirements of safety in these buildings.

In the following paper, an attempt has been made to give a brief *résumé* of these requirements, as derived from personal experience, observation and study. As regards, in particular, my views on the fire protection of theatres, the reader is referred to a detailed description given in my paper, "The Water Service and the Fire Protection of Theatres," presented at the June, 1894, meeting of the New England Waterworks Association. The gas-lighting system, the plumbing, ventilation and sanitation of theatres will likewise form the subjects of special papers, presented elsewhere.

The safety of a theatre may be said to depend on six principal factors, viz: (1) The site; (2) The plan; (3) The construction; (4) The interior equipment and arrangement; (5) The management, and (6) The periodical inspection.

The *site* of a theatre building is of importance as regards its relation to adjoining buildings, and as regards the approaches, entrances and exits. The development of the plan depends largely upon the available site.

The *planning* of a theatre consists of the arrangement of the floor-plans of the building, and of the various parts of the same with their principal horizontal and vertical subdivisions and means of communication, such as stairways, entrances and exits.

The *construction* of the building is to be considered in reference to the employment of fire-resisting materials in general, and also, in detail, in regard to the construction of the stage and its accessories; the auditorium and tiers; the dressing-rooms; workshops; the roofs; the aisles, staircases, passages, corridors, doors, entrances and exits.

The *interior arrangement and equipment* include many important details, such as the fireproof curtain, the stage scenery and stage machinery, the fly galleries, rigging-loft and painters'-bridge; the stage-roof ventilator; the heating, ventilation, lighting, plumbing, drainage and sanitation, water-supply and fire-extinguishing appliances; lightning-rods; fire-escapes, doors, auditorium-chairs, and the life-saving appliances.

The *management* includes numerous matters of detail and rules and regulations pertaining to the safety of the building on the one hand, and of the audience, the actors and the stage employés on the other.

The *periodical inspection*, finally, forms a necessary and important safeguard, and includes frequent surveys of the building and of its gas, water, steam, fire and electric appliances, all of which should be tested at regular intervals, to insure their being in proper working order when needed.

CAUSES OF THEATRE FIRES.

A study of the chief causes of theatre fires is important and necessary to a proper understanding of the subject. The knowledge of

[1] An Essay on Modern Theatre Planning, Construction, Equipment and Management. By Wm. Paul Gerhard, C. E., Consulting Engineer for Sanitary Works.

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the principal causes to which theatre catastrophes have been attributed will do much to enable us to avoid, or to remove, defects which, if present or allowed to remain, may at any time precipitate a calamity. I must, however, content myself with giving the following brief summary:

(*a*) Bad location: exposure to fire from neighboring buildings.
Bad planning: faulty interior arrangement.
Inferior or improper construction: structural defects, defective flues, timber near flues.

(*b*) Wrong use of the premises: dangerous trades carried on in stores or shops in the theatre building.
Defective lighting apparatus: oil lamps, gas and electric light; matches, torches, spirit-lamps; leaky gas-pipes, gas-explosions.
Defective heating apparatus.
Accumulation of highly inflammable stage material.
Use of fire-works, colored-lights, explosives, and of open fires on the stage; use of fire-arms; carelessness in fireworks laboratory; dancing on the stage with lighted torches or flambeaux.
Accidents to scene hoisting machinery, also hasty shifting of light and highly inflammable scenery in too close vicinity of powerful unprotected gas-flames.
Carelessness in lighting border lights.
Non-removal of rubbish and oily waste, and ignition of same, either by spontaneous combustion or by the careless throwing away of lighted matches.
Smoking in the theatre, in the actors' dressing-rooms, and on the stage. Careless throwing away of lighted cigars or cigarettes.
Careless handling and upsetting of candles or oil lamps on the stage.
Storage and undue accumulation of large quantities of scenic decorations or inflammable material of any kind near the stage.
Careless handling of actors' wardrobes, in dressing-rooms.
Use of stage or of loft over auditorium for a carpenters' or painters' shop.

Even where the indirect causes enumerated under (*a*) are avoided by having a theatre suitably located, well planned and properly constructed, the more direct causes of fire mentioned under (*b*) should be carefully guarded against by good management, strict rules and regulations, by having a well-drilled staff of stage employés, and by instituting periodical inspections of all the details forming together the equipment and interior arrangement.

STATISTICS OF THEATRE FIRES.

Statistics of theatre fires show that out of a list of two hundred and eighty-nine fires known up to the year 1878,

19 per cent started in daytime.
5 " " " one hour before beginning of performance.
12 " " " during the performance.
24 " " " within two hours after the performance was over,
39 " " " during the night following the performance.

In 1881, when these statistics included three hundred and seventy-three theatre fires, the percentage remained almost the same, viz:

19. 9 per cent of the fires started in daytime.
5. 6 " " " " " " one hour before the beginning of the performance.
11. 6 " " " " " " during the performance.
22. 6 " " " " " " within two hours after the performance was over.
40. 3 " " " " " " during the night following the performance.

These figures would tend to show a large preponderance of fires immediately following a performance and prove conclusively that the safety of theatres depends largely upon a careful and minute inspection of the building after each performance. The danger of fire, notwithstanding the above figures, is really greatest *during* a performance, but the number of casualties at these hours is not so large as might be expected, because of the stricter and more careful watching, upon which a judicious theatre management should wisely insist.

The number of theatres annually destroyed by fire is very large. According to the carefully-collected statistics of Herr Foelsch, two hundred and nine theatres were burned in the eleven years from 1871 to 1881, making an average of nineteen such buildings per year.

From 1882 to 1888, theatre fires have occurred as follows:

In 1882, 25 fires.	In 1885, 8 fires.	In 1887, 18 fires.
" 1883, 22 "	" 1886, 8 "	" 1888, 15 "
" 1884, 10 "		

Many of these fires signify not only loss of property, but loss of life as well. The large theatre-fire calamities of Brooklyn, Nice, Vienna, Paris, Exeter (England) and Oporto (Portugal), alone, were the cause of the loss of about one thousand six hundred human lives.

The large number of fires annually occurring in theatres, and the incidental great danger to the people in such buildings is easily explained by the many possible causes of fire cited above.

GENERAL CONSIDERATIONS.

If we consider the building only as such, the subject naturally divides itself into the prevention and the extinction of fire. But, looking at it from a different point-of-view, and taking into consideration that during certain hours of the day or evening the building is occupied by a vast crowd in the auditorium, and by actors, actresses, supers, chorus, ballet-girls and stage employés, often numbering several hundred people on the stage, the safety of the building becomes of secondary importance in case a fire should break out shortly before or during a performance. It then, from a humane point of view, clearly becomes chiefly a question of the safety of the spectators, the performers and the stage-hands.

It follows, as a matter of course, that both the audience and the people on the stage are much less in danger in a well-planned, well-constructed and properly equipped theatre than in a defective, antiquated, highly combustible structure in which means for protection of life, means for quick egress, and appliances for quickly putting out a fire at its start are not provided, and where both life and property are exposed to undue risks.

Then again, in all buildings devoted to amusement, recreation, instruction, or worship, in which a large number of people congregate, it is very often not so much a question of danger from fire, as it is of danger from a *panic*. Even where there is no real danger, a panic often ensues. The lives of the theatre-goers, of the actors and stage employés are imperilled, not only by the possibility of being burned to death, but they are, perhaps to a much greater degree, exposed to the direct effects of shock or fright, or to bodily injuries resulting from a rush, by falling or being trampled upon, or being crushed, and finally, there is the danger of becoming asphyxiated by the thick smoke and the fire gases or being overcome by the heat of a conflagration. A theatre building may be endangered by fire from without as well as from within, and in both cases, if the fire breaks out during a performance, the chief danger to the public arises from a sudden panic.

It obviously follows, *first*, that theatres must be so planned, constructed, equipped and managed as not only to prevent fires, but also to prevent a panic; *second*, that there should be provided, in every theatre building, not only means for the fire extinguishment, but also for protection, in case of an outbreak of fire, against the flames, the smoke and the deadly gases of combustion, the smoke constituting the greatest danger, as more people are suffocated than burned to death in a theatre fire; and *third*, and most important, that to guard against a threatening panic, crush or stampede, there should be ample means for personal safety and rapid egress.

The safety of the spectators and of the stage people is always of primary importance, and the safety of the building as regards its fire-resisting structural features is only second in order, except in so far as it naturally adds to the protection of the persons in the theatre. In other words, so far as the safety of human life is concerned, a combustible theatre may sometimes be less objectionable, if ample means of protection and safety-appliances are provided, and if the arrangement of stairs and exits are such as to permit the quick emptying of the theatre, in from two to three minutes, than a so-called fireproof theatre with insufficient safety-appliances and lacking suitable means of egress.

The *prevention of fire* in theatres is accomplished by proper location, planning, construction, interior arrangement and equipment, by proper management and by periodical inspections. But we should not forget that filling *all the requirements combined* alone provides perfect safety. For instance, a free site alone does not preclude theatre disasters. The Paris Opéra Comique stood on an open square, the Exeter Theatre had three fronts on streets, the Opera House at Nice and the Vienna Ring Theatre practically stood detached, but they lacked sufficient and proper exits; the stairs were not lighted, and in some cases the doors opened inward. Then again, fireproof building construction alone does not prevent theatre panics, if the stairs are narrow, if the passages are dark, if the smoke from a stage fire is drawn through a wire curtain into the auditorium by the suction of the ventilator over the auditorium gasalier. Again, it is not sufficient to build a fireproof proscenium-wall to completely separate the stage from the auditorium, but the large opening in the proscenium-wall must be provided with an efficient fire-curtain and other openings with self-closing fire-doors to keep out the flames and smoke, at least long enough for the audience to make their escape. Finally, the most elaborate system and complicated mechanism of standpipes, sprinklers, iron curtain, stage ventilator, etc., fail to protect a theatre audience, if the exits are inadequate and if the building cannot be completely emptied in a very few minutes. What is needed, therefore, is the combination of all known elements of safety.

The *prevention of panic* in a theatre requires first, the avoidance of all usual causes of fire, and second, the elimination of defects in construction and plan, such as narrow and dark passages, winding staircases, crowded seats, insufficient number of aisles and exits, doors opening inward, and a badly hemmed-in site. The audience must know that it will be able to leave the building quickly and safely in case of a false alarm, or a panic, caused by a fire-alarm in the neighborhood, or by the sudden accidental extinguishment of the lights in the theatre, or by the falling of a part of the scenery or decoration, or from any other disturbance of the performance.

The *means of protection* in case of *fire* include the use of the fireproof curtain to cut off the audience from the sight of the fire and from the smoke and fire gases, the use of the stage-roof ventilator, to remove quickly the smoke incident to a stage fire, and means for fighting the fire, such as a sufficient fire and water service, ample fire-appliances, fire-alarm, etc.

The *means of safety* in the event of a *panic* are: for the audience, plenty of plainly marked exits, wide aisles without steps or obstructions, well lighted and wide corridors and staircases, plenty of wide

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stairs with strong hand-rails on both sides, suitable fire-escapes, wide doors opening outward and preventing a jam; and for the theatre employés and the actors, isolated dressing-rooms, fireproof stairs, a sufficient number of separate and direct exits from the stage to out doors, and safe means of retreat from the fly galleries and the rigging-loft.

From whatever point-of-view we consider the subject, whether we are concerned with the safety of the building and its usually valuable and expensive contents, or with the safety of the theatre audience and the stage people; whether we wish to prevent a panic or a conflagration, the following are the principal requirements of a modern theatre building, and the principal safeguards, which for absolute security must be insisted upon.

LOCATION AND SITE.

The ideal site for a theatre is on a wide public square, the building having approaches and standing free and isolated on all four sides. For absolute safety this is really the only available site, as it affords the best opportunity, not only for architectural effect, but also for judiciously providing and arranging numerous exits from all parts of the house. Such a site is, however, rarely attainable in our large cities, where the price of land is enormously high. If the requirement of a free site were insisted upon, it would cause the building to cost too much, and would thereby render more difficult theatrical enterprises, which in this country are not subsidized by the Government, but are private commercial enterprises.

The opposite extreme, namely, a theatre building entirely surrounded or hemmed-in by other buildings, is of course inadmissible, owing to the constant exposure of such a theatre to danger from outside, and on account of the increased difficulty in saving life in case of a fire or a panic within. Theatres having entrances or exits necessarily carried through other buildings are bad and dangerous. Windows or openings in the outside walls of a theatre looking towards other buildings in close contiguity to the same, are a constant menace and danger.

If a theatre building is located in a street block, it should have, at least, one front on the street, and there should be provided in the plan, wide open courts at both sides. If the building is a corner building, located at the intersection of two thoroughfares, there should be one such court. The width of these courts should be in proportion to the number of people which the theatre is expected to accommodate. The New York Building Law requires the courts to be not less than 7 feet wide each for 1,000 persons, 8 feet for 1,000–1,800 persons, and 10 feet for a theatre of a capacity above 1,800 people. The court should begin on the line of the proscenium-wall and should extend in front to the wall dividing the lobby from the auditorium. Separate corridors should continue from there through the front superstructure to the street. These corridors, according to the New York law should not be reduced more than 3 feet in width, whereas it would seem much safer to continue them the full width to the street. The outer opening should have iron folding gates or doors opening outward, and kept open during and at the end of each performance.

Better than a building on a corner lot, is a theatre standing free on three sides, owing to the reduced danger from the adjacent buildings or surrounding stores and shops.

PLAN OF BUILDING.

The theatre plan should be simple, compact and clear, and as much as possible symmetrical so far as entrances and stairs are concerned.

To the mind of the theatre-going public the plan resolves itself into only two principal divisions, that *before* and that *behind* the curtain. This, in practice, hardly covers the requirements.

All theatres should be planned with a number of internal divisions, each of which is to be made in itself as fire-resisting as possible, to prevent the spread of fire from one part to another. There should be in every theatre, whatever its size may be, at least four principal and distinct internal divisions, each entirely separate and isolated from the rest, as follows:

(1) The auditorium; (2) The stage; (3) The dressing-rooms; work-shops, offices, and wardrobes; (4) The stairs, foyers, lobbies, corridors, passages, cloak-rooms, refreshment-rooms, the entrances and exits.

The auditorium comprises the various parts where the spectators are seated, namely the parquet, or orchestra, and dress-circle, the balcony, gallery, the tier of boxes and, above all these, the auditorium loft and roof. Each subdivision or tier in the auditorium should have separate entrances and exits. The number of tiers in all theatres, except very large opera-houses, should be restricted, because the danger is increased as the building increases in height. As a rule, there should be only two tiers — the balcony and the gallery. The fewer steps necessary to reach the street from the different parts of the auditorium, the safer will the audiences be. In nearly all large theatre catastrophes, the largest number of those killed were persons who occupied the upper galleries. For the same reason, it should be prohibited to place the main auditorium on the second floor for the sake of utilizing the street floor for stores. The New York Building Law requires that the main front entrance to the theatre be not more than four steps above the sidewalk. It is desirable that there should be wide corridors running around each gallery or tier, of capacity to hold the total number of persons on each division. There should be no obstructions of any kind in these corridors.

The stage may be subdivided into the under stage, the stage proper, the wings, the fly galleries, the rigging-loft, or gridiron, and the stage roof.

The stage is the special domain of the actors and singers, of the scenic artist, of the theatre machinist and of the gas or electrical engineer. It is also the chief point of danger in a theatre, owing to the large amount of constantly changing and shifted combustible scene material, and owing to the numerous and powerful illuminants and their incidental heat and liability to set decorations or hoisting machinery on fire.

The general term "stage" includes several divisions, of which the stage-floor proper is the largest and constitutes the scene of the play. The stage-floor has on each end immovable sides or wings, whereas its middle portion is so framed as to be changeable or removeable. As a rule, the stage floor is built with a slope towards the foot-lights, although the more recent theatres have level stage floors. The floor is constructed of narrow, well matched, tongued-and-grooved boards of well-dried pine, and it is planed absolutely smooth. The space directly under the stage is taken up by the traps operating the movable parts of the stage-floor and by the machinery belonging thereto.

The fly galleries are located on both sides of the stage at such a height above the wings as to enable the proper manipulation of all borders, drops, etc. As a rule, smaller theatres have only one fly gallery, but sometimes two are arranged, one above the other. In some theatres the fly galleries are connected at the back of the stage by a painters'-bridge thrown horizontally across the stage, and either stationary or else arranged so that it can be raised or lowered.

Above the fly galleries the rigging-loft or gridiron is built across the whole stage, and is covered with narrow slats, laid some inches apart. Here are located the blocks and drums, the ropes and pulleys to which the drops, borders, and curtains are attached. Above the rigging-loft is the stage roof, with the stage ventilators or sliding skylights.

The dressing-rooms for actors and actresses are generally arranged in tiers on one or on both sides of the stage. Of dressing-rooms there is a more or less large number, according to the size, purpose and special use of the theatre, and besides the single rooms for the "star" and the prominent actors, there should be larger dressing-rooms for the "supers," for the male and female chorus, and for the members of the *corps de ballet*. Dressing-rooms under the stage, or in the basement, generally without light and air and unsanitary, are an abomination and should be prohibited. This division of a theatre generally also contains the theatre-manager's office. In larger theatres there should be, in addition to those mentioned, a room for the stage-manager, a room for the musical-conductor, a room for the orchestra, rooms for rehearsal of the chorus and ballet, offices for the scenic artist, rooms for the painter, the costumer, the property-master, the master or stage carpenter, the stage machinist, the gas-engineer and the electrician, the chief engineer in charge of the boiler and pump plant, and other members of the theatre staff, besides a large room for wardrobes and costumes.

Scenery-making, scene-painting and carpentering on a large scale should not be permitted in the theatre proper. There should be provided, in a separate annex or fireproof building, such paint-rooms, carpenter-shops, scene-docks, store-rooms for timber, furniture, etc., and other workshops as the business of the theatre may require. The stage or the under stage, or the fly galleries should never be used as a carpenter or paint shop, nor should such work be performed, as is often the case in the older theatres, in the loft over the auditorium. Neither should this loft be appropriated for the storage of inflammable material. The rear of the stage should not be used as a scene-dock.

The combination of a hotel and a theatre, or of a theatre and office-building, which is still quite common, cannot be approved from the point-of-view of safety, as each part endangers the other. No living or sleeping apartments should be contemplated in the plan of a theatre; no workshop, manufacturing establishment or store-houses should be combined with it, and on the street floor stores should only be provided if separately fireproofed, if completely isolated from the theatre by thick brick walls, and if the stores are kept accessible from the street only.

The furnace or heating apparatus, and the steam-boiler room should never be placed under any part of the stage, the auditorium, or the stairways. It is advisable, where a separate building for the boiler cannot be obtained, to place it in a vault under the sidewalk.

The fourth division comprises the foyers, the theatre lobby, the toilet-rooms, lavatories and retiring-rooms for the public, the principal stairs for the various tiers, the corridors, passages and the entrances and exits. The corridors, foyers and lobbies should be roomy and amply large to furnish standing-room for all persons in each division. The lobbies should be separated from the auditorium by fireproof walls. Still better is the plan of having large open safety terraces or open colonnades on both sides of the auditorium, with stairs leading to the street, thereby preventing all possibility of a jam or crush.

There should be provided, for every section of the house, suitable and well arranged toilet-rooms for men and for women. If cloak-rooms or wardrobes for the public are included in the plan, they

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should be located near the entrances, but their arrangement must be such that persons who wait at the cloak-rooms do not interfere with the retiring audience passing through the corridors to the exits.

All corridors, passages, stairs and aisles must be planned to be free from all obstructions, such as wardrobes, refreshment-rooms, or radiators, and so as to permit the quick emptying of the house. The crossing or meeting of two streams of people on their way out, either in the lobbies, or in the passages, or on the stairs, must be prevented.

The stage and the auditorium form two large spaces which cannot well be subdivided. All other parts of the theatre should be subdivided into as many distinct and separate fire risks as possible.

The four principal divisions of a theatre should be separated and completely isolated from each other by fireproof walls and doors. Each division should be enclosed in fireproof walls and made as incombustible as possible. Likewise should all horizontal subdivisions, the ceilings, roofs and stairs be made fireproof, in order to localize and confine a fire, so that it can burn itself out. There should be as few openings of communication in the various fireproof divisions as possible, and where these openings are necessary, there should be means provided for closing them in case of fire by fire-doors, opening outward. It is most important that the stage be completely separated from the auditorium by a fireproof proscenium-wall, carried from the cellar to a height of three feet above the roof, the full width of the building. This wall should have only a few openings, namely, the large proscenium-opening, closed by a safety or fire curtain, of iron or asbestos, and not more than two other openings, at or below the stage level, closed by automatic or self-closing fire-doors without locks or bolts. There should be no communication between the stage building and the auditorium at any point above the level of the stage.

(To be continued.)

CHURCH BELLS.[1]

PERHAPS the earliest bells of which we have any record are the small bells which were hung from the edge of the ephod worn by the high priest, of which Moses speaks. Bells do not appear to have been introduced into Christian worship until the fifth century. Paulinus, Bishop of Nola, in Campania, is generally credited with their invention or introduction into church use. These early bells were hand-bells, and were made of iron plates beaten into four-sided shapes, and welded or pinned. These were called "nolæ," and the larger bells "campanæ." Church bells are, however, also called "signa" in mediæval documents. Bronze bells were found by Mr. Layard at Nineveh; they have also been found in Indian cromlechs and cairns, and small bells have been found in Egypt of the Ptolemaic period.

Mr. Westwood, in "*Arch Cambrensis*," speaks of the Irish in their early attempts to Christianize Iceland carrying with them Irish books and bells. The term "tintinnabulum" was given to a set of small bells of different tones set in a row and struck by a hammer, but we soon find the nola, or hand-bell, generally called tintinnabulum. Some of these, of great antiquity, are now extant in Ireland, North Wales and Scotland. Bells appear to have been used in Ireland as early as the time of St. Patrick (died 493). Giraldus Cambrensis says that "both the laity and clergy in Ireland, Scotland and Wales held in such veneration certain portable bells that they were more afraid of swearing falsely by them than by the Gospels, because of some hidden and miraculous power with which they were gifted, and by the vengence of the saint, to whom they were particularly pleasing, their despisers and transgressors were severely punished." When St. Teilo was raised to the Episcopal dignity, we were informed by the "*Liber Landavensis*" that "the people presented him with a bell that was more famous and great, more valuable in reality than appearance, because it condemned the perjured, it healed the sick, and, what appeared more wonderful, it sounded every hour without any one moving it." This bell was called "Bangu," a name which later on was given to a hand-bell kept in all the Welsh churches, and which, among other uses, always took part in funeral rites. The clerk or sexton took it to the house of the deceased on the day of the funeral; when the procession started, a Psalm was sung, then the bellman sounded the bell in a solemn manner for some time, when another Psalm was sung, and again sounded it at intervals until the funeral arrived at the church. It is the custom at Oxford for a bellman to precede the funeral procession of any member of a college, sounding the bell at intervals until the corpse arrives at the place of interment. The late Professor Westwood, in writing of a bell of bronze which has been kept in the church of Llangwynodl, Carnarvonshire, says that the clerk before a funeral used to go round the churchyard ringing the bell. He further says that there are persons still living who remember that in Carnarvon a bell used to be rung through all the streets to give notice of an approaching funeral. At Holywell, Flintshire, a person goes round the town ringing a bell to call the inhabitants to church, from which he is called the "walking steeple." The bell at Llangwynodl has serpents' heads for the terminations of the handle where it is attached to the bell. The bell is flat-sided, and has a clapper formed of a long iron stem, with a ring of the same metal fastened near its extremity, and suspended from a hoop of metal fixed within the upper part of the bell beneath the handle.

In the *Journal of the Archæological Institute*, vol. 5, p. 330, is described an ancient bronze bell which was found at Marden, Herefordshire, in cleaning out a pond. The pond is only a few yards from the church built on the spot where the body of St. Ethelbert, murdered by Offa, was said to have been deposited. The site of the vicarage has been asserted to have been that of Offa's palace. The bell appears to have been formed of a sheet of bell-metal which had been hammered into shape and riveted. The handle at the top is rounded beneath for the hand; the clapper is gone, but there is a loop inside from which it was suspended. It is 12 inches in height, without the handle, 7½ inches across the bottom in the widest and 5 inches in the narrowest diameter; the upper part is 5 inches in the largest and 3 inches in the narrowest. The circumference at the top is 15 inches, and at the bottom 24½ inches. The rudeness of this bell, as well as the proximity of the locality to Wales, would lead to the supposition that it is a relic of the British rather than of the Anglo-Saxon Church, strengthened by the description of a similar bell preserved at Birnie, in Scotland, the Christians of which country were disciples of the early Irish Church, between which and the British, on the authority of the Venerable Bede, there were no material distinctions. Two bells of a similarly early make have been found at Llandensant and Llanrhyddlad, and were probably used in the celebration of mass. The bell of St. Kentigern, the great apostle of Strathclyde, after forming for centuries a prominent feature in the armorial bearing of the archiepiscopal see, still figures in the modern arms of the city of Glasgow. Many other Celtic and very ancient bells are figured and described by the Rev. H. T. Ellacombe in his treatise on the bells of the church. There is a figure of a bell-ringer on a Saxon font from Hutton Cranswick, now in the York Museum, and on a column of a chancel arch at Stoke Dry, Rutland. The bell-ringer on the font is supposed to symbolize the devil driven out at baptism. Quadrangular bells of the Celtic type are to be seen sculptured on the crosses at Winwick, Lancashire, and Kilcullen, Wicklow; also on the lintel of a doorway at Glendalough, Wicklow. I have seen in the possession of Sir Henry Dryden a similar bell to these ancient Celtic bells which I have described, but its history was lost. These bells are precisely similar to the small bell now used for attaching to the neck of a sheep, the bell-wether of the flock, on the Downs. There was another sort of Irish bell of a pear shape, called "crotal," several of which are now in the museum of the Royal Irish Academy.

I now come to speak of large bells, and I might preface my remarks by an allusion to the curfew. The sounding of an "ignitegium" was a custom which prevailed in Spain, Italy and Scotland, and most of the countries of Europe, when it was instituted by King Alfred the Great at Oxford, and later on, more rigidly enforced by William the Conqueror. The law was abolished by Henry I in 1100. Pope Sabinianus (A.D. 604), having ordered the hours to be sounded on the bells, is thought to have introduced the use of the campanæ, or signa, as the large bells were called, into churches.

The Westminster clock bell, the largest we have, was cast by George Mears in 1857; it weighs 13 tons 10 cwt. 3 quarters 15 lbs. It was designed by Edward Beckett Denison, Q. C., the ornamentation being designed by the late Arthur Ashpitel, F. S. A. This bell is commonly known as Big Ben of Westminster. Peter of York is the next largest. It was cast by Messrs. Mears in 1845, and weighs 12½ tons. The mighty Tom of Oxford is the next; it weighs 7 tons 12 cwt., and was cast in 1681 by Keen, or King, a Woodstock bell-founder. The great bell of the Cathedral of Lincoln was cast by Thomas Mears in 1834, and weighs 5 tons 8 cwt. The great bell of St. Paul's, inscribed "Richard Phelps made me, 1716," weighs 5 tons 4 cwt. The Great Peter, of Exeter, is reported to weigh 6 tons 5 cwt., and was re-cast in 1676 by Thomas Purdue. Great Peter of the cathedral at Gloucester is thought to have been founded early in the sixteenth century. It has the founder's escutcheon (three bells) and the arms of the church (a sword and two keys, saltire) and the inscription, "Me fecit fieri Conventus nomine Petri." Besides this bell — the clock — Gloucester has eight bells, of which five or six date from 1390–1418, and were founded by Robert Burford, of London. No. 5 is a Mary bell. Great Peter weighs upwards of 2 tons 18 cwt. The Moscow bell is said to weigh 220 tons, and one at Trotzkoi 171 tons. A bell of early in the fifteenth century forms the third bell of St. John's, Coventry. It bears the inscription, "Henricus Dodenhale me fieri fecit," and on the crown "C ST. JOHIS.," which probably stands for Campana Sancti Johannis. At St. Chad's Church, Claughton Lane, there is a bell which is thought to be of the date 1296. It bears inscribed thus, "ANNO DNI M CC NONO AI +." The letter "v" is reversed. At Cold Ashby, Northamptonshire, one is inscribed "+ MARIA VOCOR ANO DNI M CCC XVII." Two richly-ornamented bells, dated 1323, are in the tower of St. Mary, Somercotes, Lincolnshire. Bells of the fourteenth century rarely bear their date, but generally have an invocation to some saint and the founder's arms or trade-mark. Sometimes bells have the alphabet, or some portion of it, instead of inscription. Such a bell may be seen at Ryton in this county. About thirty years ago, on taking down a bell for repairs to the steeple of the church of Ornolac, near Ussat-les-Baines (Ariège), it was found to bear the date 1079, and must, consequently, be one of the oldest hanging bells in Christendom.

[1] A paper read by Mr. S. S. Stanley, at the annual meeting of the Warwickshire Archæologists' and Naturalists' Field Club.

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The remarkably fine bells of Limerick were originally brought from Italy; they had been manufactured by a young native, and finished after the toil of many years, and he prided himself upon his work. They were subsequently purchased by the prior of a neighboring convent, and, with the profits of this sale, the young Italian procured a little villa, where he had the pleasure of hearing the sound of his bells from the convent cliff, and of growing old in the bosom of domestic happiness. This, however, was not to continue. In some of those broils, whether civil or foreign, which are the undying worm in the peace of a foreign land, the good Italian was a sufferer among many. He lost his all, and, after the passing of the storm, found himself preserved alone, his fortune, friends, family and home having perished. The convent in which the bells, the *chef-d'œuvre* of his skill, were hung was razed to the earth, and these last sold, to be carried away to another land. The poor unfortunate, haunted by his memories and deserted by his hopes, became a wanderer over Europe. His hair grew gray and his heart withered before he again found a home or a friend. In this desolation of spirit he formed the resolution of seeking the place to which these treasures of his memory had been finally borne. He sailed for Ireland; proceeded up the Shannon; the vessel anchored in the pool near Limerick, and he hired a small boat for the purpose of landing. The city was now before him, and he beheld St. Mary's steeple lifting its turreted head above the smoke and mist of the old town. He sat in the stern and looked fondly towards it. It was an evening so calm and beautiful as to remind him of his own native haven in the sweetest time of the year — the death of the spring. The broad stream appeared like one smooth mirror, and the little boat glided through it with almost noiseless expedition. On a sudden, amid the stillness, the bells tolled from the cathedral; the rowers rested on their oars, and the boat went forward with the impulse it had received. The old Italian looked towards the city, crossed his arms on his breast and lay back in his seat; home, happiness, sound recollections, friends, family — all were in the sound, and went with it to his breast. When the rowers looked round they beheld him with his face turned towards the cathedral, but his eyes were closed, and when they landed they found his body cold.

A NOVEL WATER SCHEME.

A SCHEME for the improvement of the town water-supply, which possesses some novel features, has just been carried out at Great Malvern, a popular inland watering-place and health resort in England. In the first place, no pumping has been employed either for the collection or distribution of the water. The supply is obtained direct from the surface of the Malvern Hills,— a lofty range extending about five miles north and south of the town,— by an extensive and ingenious system of catch-water drains. These drains consist of a trench, averaging four feet in depth, in which are laid "spigot-and-faucet" earthenware pipes, varying from six to twelve inches in diameter, and jointed half round with Portland cement. Of such drains, a total length of over 4,000 yards has been laid, girdling the slopes of the hills. A 9-inch wall of clay puddle forms the underside of the drain, and this acts as a dam to stop the water as it trickles from the hills above, so that it collects above the pipes and falling into them, through the half-open joints, runs down by force of gravity into intake wells, placed at suitable distances in the ravines between the hills. Thence, it is carried by fire-clay connecting-pipes, to a main conduct — a 15-inch cast-iron pipe,— which runs along at the foot of the hills to the new reservoir.

The reservoir is situated on the east side of a conspicuous hill, about four miles from Great Malvern, at a height of 670 feet above sea-water level. The main collecting-area, however, over which the catch-water drains have been laid, is on the slopes of the hills, immediately over-topping the town. Consequently, much of the water has first to be carried a distance of four miles, for storage in the reservoir, and thence brought back again the same distance, for distribution in the town. This double operation — and herein consists the novelty of the scheme,— is performed by a single main conduct. This, at first hearing, may seem impossible; but the simple explanation of it lies in the fact, that the collecting-area is thirty feet above the level of the reservoir, while the distributing-level is twenty feet below it. Thus, the water is able to flow either way, without reference to the grade of the pipe itself, though not, of course, at the same time. In the winter, when the consumption in the town is comparatively small, it is proposed that the supply should be drawn mainly from the old reservoir, which is situated close to the town. To supplement the resources of this, separate connecting-pipes have been laid to it from three of the new intake wells, and, by means of valves at the wells, the water accumulated in these can be directed into the old, instead of the new, reservoir, should occasion require it. From the old supply, thus supplemented, Malvern's winter water will be drawn, and, thus in the season of heaviest rainfall, the new main conduct, being not required for distribution, will be left free for the conveyance of store-water to the new reservoir. In the summer this store will have to be drawn upon, and then the new main will be used chiefly for distribution. In dry summers it will be quite free for such use, because the intake wells with the relief afforded by their connection with the old reservoir will be adequate for the reception of such small contributions as come in from the catch-water drains. During heavy summer rainfall, however, the water used in the town will probably be drawn direct from the intake wells, while any which flows into the main conduct in excess of what is required in the town, will flow in the opposite direction, in its more usual course to the new reservoir.

C. H. G.

BOOKS AND PAPERS.

TO all architects who take any interest in the construction of the stage of a theatre and in the manner in which it is used, we recommend the perusal of "*La Machinerie Théatrale*," "Truc et Décors," by M. George Moynet (Paris: La Libraire Illustré). The author of this popularly written book shows an intimate knowledge of the construction of the stage, its fittings and the purposes for which they are used. Apart from its technical worth, the volume is one of great interest even to those whose architectural practice does not tend towards theatre-building.

The major portion of the book is, unfortunately, confined to the description of the old wooden stage, more especially the French one. The first few chapters are devoted to the arrangement of the stage floor, the construction of the cellars, mezzanine, traps, cuts and slides, illustrated by very clear and interesting, though somewhat crude, diagrams.

Upon comparison, there appears to be but slight difference between the French stage and that used in England and America. The French stage, however, is depicted in the work we have now under our notice, as having far greater depth below the stage devoted to the "cellars" and "mezzanine" floors, there being in some of the cases illustrated as many as three or more tiers, or floors, under the stage level; indeed, in the plate showing the cellars of the Grand Opera-house, Paris, (page 172), five tiers or floors are shown below the stage; these are supported upon a series of iron columns and girders. All of these floors open to permit of scenery being taken down to the lowest floor.

Several details of the wooden traps are given, showing their construction and the method of working them, which is explained very clearly by the illustrations.

In but few theatres with wooden stages are there to be found more than one tier of flies; in a very few there are two or three; much of the scenery is now in the form of set scenes, braced up from the stage floor. It is different, however, on the Continent, as shown by the plates of the "*corridor de service*" of the Grand Opera-house, Paris, where there are six tiers of flies.

The "Gril," or gridiron, is shown in the woodcuts with the accompanying mass of "drums" and ropes, and two whole chapters are devoted to the consideration of the scenic arrangements of the Paris Opera-house.

This work gives a much better idea of the mysteries of the stage-carpenter's art than anything that has previously come before us; Having so much information to impart, it is a pity the author devotes three hundred and seventy out of four hundred pages to work entirely French, thereby robbing an otherwise interesting book of much of its value.

As in England, the wooden stage reigns supreme in France; indeed, this system has only in one or two exceptional cases, notably the Paris Opera-house, been given an iron instead of a wooden skeleton.

Some notice, however, is given of the Asphaleia stage at Budapest, a plan of which is produced, as well as a "view," showing the working of the "panorama," and the hydraulic lifts to the traps.

It is to be regretted that no notice is taken of the later development of the Asphaleia system, as seen in the Hofburg Theatre, Vienna. The whole of the efforts to modernize the stage in Austria and Germany is only touched upon in this short description of the Budapest Opera-house, and Italy's excellent work is almost forgotten. England is only touched upon with regard to the spectacular exhibitions which have found a home at the "Olympia," in London, while America is referred to in connection with a horse galloping on the Union Square stage, at New York. It is certainly a pity that nothing that can be called new is to be found in this bulky volume, and that the author seems to have little interest in what has been going on in the last decade.

It is because the work is so interesting so far as it goes, that we express regret at these omissions, for it must become a standard volume for the student of stage machinery, and we may venture to hope a supplement may be written dealing with the modernized stage machinery of Europe and America. We cannot include England, as the machinery there has not been changed, even in the latest additions to the play-houses, from what it was over a hundred years ago. As a description of a wooden stage, the study is excellent, the most complicated parts being easily understood from the popular description, and the many woodcuts, which are prepared from M. Moynet's own sketches, will greatly assist the the student to understand the mysteries of stage-land. The book, as it stands, is the only one of its kind, and we are pleased to note that the publishers have ventured to put the work before the public in a more than usually clear type and not at a prohibitive price.

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The chapter upon lighting should not be overlooked: the fittings for electric-light on the stage are illustrated, and the rules for measures of precaution by the French authorities, as to the electric-lighting in theatres and other places of public resort, are given in full. The arrangements for the scene-painters' room are not forgotten.

We have not noticed here a large part of the book given to an exhaustive explanation of stage illusions, and how stage thunder, lightning, wind and rain are created, as these are matters which are more for the curious than the architectural student of theatre-construction. The omission of an index is a mistake on the part of the publishers.

It is curious that, although our motley population is composed of large aggregations of foreigners, who have naturally settled in the same section of the country where their native manners, customs and language have been preserved almost intact in daily use, these foreign clans have had comparatively little effect on the architecture of the country. One would, not unnaturally, look to find the domestic architecture in sections settled by foreigners bearing evident traces of the architecture of the countries from which these people came; but, though you can find German, Swedish, French, Italian, Polish and Hungarian villages and quarters of cities, there you will find merely American buildings occupied by foreigners. The old foreign settlers stamped an individuality on their dwelling-places which still lingers, so that Quebec, the Acadian villages in Louisiana, and the villages in California and the South-west, where Spaniards settled, have, to this day, a foreign air.

In another point, one might expect to find traces of a foreign populace, and that is in the gardens. But gardens, after all, are things, which, as a rule, the working-classes have no means to procure and little leisure to enjoy, and it is hardly fair to look here and there for traces of the interesting ethnical indications that imbue Dutch, English, French and Italian gardens and gardening methods, each distinct in itself, and each different from the others. The formal English garden is as different from the formal French garden, as that is from the formal Italian garden, the progenor of both, while the Dutch garden is as individual as that of the Japanese proprietor.

Little by little, thanks to the efforts of a few able landscape-gardeners, who have been entrusted with the development of public parks in various parts of this country, more and more consideration and respect is being shown for the art of gardening when properly practised; but, until recently, what has been done has been the work of landscape-gardeners and not of landscape-architects. What had been accomplished previously had shown a fairly distinct national character, as effort had been expended mainly in the direction of the development of picturesque effects, rather than in the devising of formal and stately ones. Perhaps the reason for this is, that so few people in this country have the trained imagination to forecast the final effect of a formal and architectural arrangement. The cold and stiff presentation of a formal and stately garden looks forbidding enough upon a paper plan, wherefrom the uninitiated cannot deduce the real value of vistas and main features, when softened and refined by the carefully guarded development of vegetation.

It seems to us that landscape-architects, who are about to present a scheme for a formal garden to public authorities or private owners, make a mistake in presenting for consideration the formal engineering drawings only, and do not have the forethought to reinforce their recommendations with the supporting testimony that can easily be procured in the shape of photographs, which would show what is likely to be the relative and final effect of the proposed scheme, after the lapse of years. For just such a purpose as this, the little book[1] prepared by Mr. Charles A. Platt seems especially and providentially designed; though, for the purpose we indicate, the book would have been more valuable, if, to the delightful views of Italian gardens in their present aspect had been added more of the original general schemes.

The Italian garden is a thing with which architects and sculptors had much to do: it is a combination of balustrades, steps, fountains, statues, grottos, casinos, and other structures which furnish backgrounds, supports and points of interest for the main and accidental vistas, which the landscape-architect provided for in his first conception. They are wonderfully beautiful and pleasing, and their virtues are so many that it is high time they were transplanted, in the way of copies, to some portions of this country. The lush growth of vegetation in some parts of the Southern States, as well as the States on the Pacific Coast, offer the natural conditions which would make easy the reproduction, on a large or small scale, of even the most delightful gardens, once the scene of the social festivities of the High Renaissance. There are now in this country landscape-architects capable of conceiving such pleasure-grounds, and there are also plenty of architects and sculptors who can capably carry out their conceptions. All that is lacking is the class of "rich amateur," willing to spend a portion of his income upon a garden, rather than all of it upon clubs, bric-à-brac and horse-racing.

An old friend comes before us in a new dress in the shape of Clark's *Building Superintendence*, bearing the imprint of Macmillan & Co. of New York. The fact that the twelfth edition is now in the market, speaks to the continued popularity of this extremely serviceable book.[2]

The annual volume containing the *Proceedings* of the Twenty-seventh Annual Convention of the American Institute of Architects, held at Chicago last August, is a much more portly one than is usually issued. The reason for this is, that it contains also the papers nominally prepared for the Institute's convention, but actually by the courtesy of the officers of the Institute read before the World's Congress of Architects, and by this transforming what must otherwise have been a most gloomy failure into a fairly successful occasion.

The greater part of these papers were published in this journal, but it is always a convenience to have such things in a collected form, and doubtless many readers have awaited the anticipated issue of this annual volume before informing themselves as to what their fellows found worthy of talking about last year.

One curious fact seems to indicate once more the rather selfish and self-centred character of American architects,— or is it merely an indication of self-distrust as to the substantiality of their own acquirements? The *Proceedings* contain no indication that the reading of these papers evoked any discussion amongst the auditors, while, as a rule, the discussions that usually follow the reading of papers at World's Congresses, on the other side of the Atlantic, are quite as interesting and instructive as the papers themselves.

Mr. Barr Ferree has evidently consumed a considerable amount of time in bringing into final and very complete and intelligible shape a tabulation setting forth the architectural chronology of French Cathedral churches, not only those which are popularly known under this head, but many that even well-informed architects have never heard of or seen, or if they have seen or heard of them, have not been accustomed to think of as belonging in the ranks of cathedrals. The table is arranged alphabetically, and the chronological columns set forth the changes that have transpired during each of the nine centuries, more or less, that have elapsed since its foundation.

The tabulation will be found of great use to the few who take interest in the subject and have time enough to give to the study of the archæological branch of architectural history, and its value is enhanced by the accompanying copious bibliography of general and special works dealing with the French ecclesiastical architecture.

The table with its accompanying descriptive matter was originally published in the *Architectural Record*, and since its appearance there, has been republished in pamphlet form for private distribution.

It is quite immaterial how conceited a man may be, or how personally obnoxious a person he may be to be thrown with socially, if only he has the power to create for us elders such a living type as "Mulvaney," and for our children such lessons in pluck as are given by little "Rikki-tikki-tavi," the hero of one of the series of tales recently published in *St. Nicholas*, and now republished in book-form.[3]

A bound volume of the *Century Magazine* offers a rather impressive lesson as to what a small profit may accomplish, if only it be multiplied by a sufficiently large factor. That such a book can be sold for the price it is seems unbelievable, and the fact that it is so sold shows what a handicap is laid upon the conductors of other somewhat similar journals, whose field of operations is so restricted by the nature of things that their enterprise can never have the benefit of a gigantic multiplicand, and their accomplishment can never be commensurate with their aspirations.



DEPARTMENT OF ARCHITECTURE, BROOKLYN INSTITUTE ARTS AND SCIENCES. — OFFICERS FOR 1894 AND 1895, ELECTED MAY 16, 1894.

Walter Dickson, *President;* Isaac E. Ditmars, *Vice-President;* Washington Hull, *Secretary;* Gustave Jahn, *Treasurer.*

STANDING COMMITTEE.

Current Work: — Albert E. Parfitt, William Danmar, and Franklin W. Hooper.

Museum and Library: — George L. Morse, Richard M. Upjohn, and Barr Ferree.

Committee of Competition: — A. G. Thomson, J. M. Hewlett, and George P. Chappelle.

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[1] "*Italian Gardens.*" By Charles A. Platt, New York: Harper & Brothers, 1894.

[2] "*Building Superintendence.*" A manual for young architects, students, and those interested in building operations, as carried on at the present day. By T. M. Clark, F. A. I. A., New York: Macmillan & Co., 1894. Price $3.00.

[3] "*The Jungle Book.*" By Rudyard Kipling, New York: The Century Co., 1894.

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Professional Practice: — Louis De Coppet Berg, I. E. Ditmars, and Charles T. Mott.

Social Intercourse: — H. P. Fowler, F. J. Berlenboch, Jr., and Oswald Spier.

Finance and Audit: — J. B. Snook, Stephen W. Dodge, and Frank Quimby.

Committee on Architectural School and Annual Exhibition: — Not yet appointed.

ILLUSTRATIONS

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

THE CITY HALL, NEW YORK, N. Y. JOHN McCOMB, ARCHITECT.

[Gelatine Print, issued with the International and Imperial Editions only.]

THE VENETIA APARTMENTS, MINNEAPOLIS, MINN. MR. H. W. JONES, ARCHITECT, MINNEAPOLIS, MINN.

THE HOUSE OF JACQUES COEUR, BOURGES, FRANCE.

HOUSE AT CHESTNUT HILL, PHILADELPHIA, PA. MESSRS. RANKIN & KELLOGG, ARCHITECTS, PHILADELPHIA, PA.

SKETCH FOR CLUB-HOUSE AT BAYSHORE, LONG ISLAND, N. Y. MR. F. T. CONNELL, ARCHITECT, NEW YORK, N. Y.

PATHOLOGICAL BUILDING AND MORTUARY CHAPEL FOR THE CITY HOSPITAL, BOSTON, MASS. MR. E. M. WHEELWRIGHT, CITY ARCHITECT, BOSTON, MASS.

[Additional Illustrations in the International Edition.]

THE MASSACHUSETTS STATE BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MESSRS. PEABODY & STEARNS, ARCHITECTS, BOSTON, MASS.

[Gelatine Print.]

THE CANADIAN GOVERNMENT BUILDING, WORLD'S COLUMBIAN EXHIBITION, CHICAGO, ILL. MR. R. E. EDIS, ARCHITECT, LONDON, ENG.

[Gelatine Print.]

346 STRAND, W. C., LONDON, ENG.: EXTENSION OF PREMISES FOR THE *Morning Post*. MR. H. O. CRESSWELL, ARCHITECT.

OUR illustration shows the new extension of premises of the *Morning Post*, which has been recently completed at the corner of Wellington Street and the Strand, and adjoining the old premises in Wellington Street.

Externally, the general lines of the old building had to be followed, the materials used being red brick and Portland stone. Internally, the accommodation provided includes advertisement office and cashier's department on the ground-floor; manager's department and additional rooms for the editorial staff on the first and second floors, caretaker's rooms on the third floor, and an extension of the composing-room and reading-rooms on the fourth floor. In the basement is the machine-room, including new boiler and engine, with coal stores, etc., and set of new web printing-machines by Foster, of Preston.

The building is of fireproof construction throughout, the floors being on Fawcett's system and the internal partitions of concrete and iron, wood being only used for joinery-work and fittings.

WHITE HART HOTEL, BLACKWATER, ENG. MR. GEORGE W. WEBB, ARCHITECT, READING, ENG.

THIS hotel has been rebuilt and stands on part of the site of the old building, which has been pulled down, owing to its unsafe condition. The new building is much larger than the old one. On the first floor there is a large assembly-room used for balls, masonic and other purposes.

The facing bricks are of a deep red tint and the tiles of a dark-red color.

HOW FRANCE SUPPORTS ART. — The sum which is voted by the Legislature for the Fine Arts is ridiculously small. Germany spends for Fine Arts more than $100,000, and England $160,000 a year; while France, for the galleries of the Luxembourg, Versailles, Saint Germain, and the Louvre with its six departments, appropriates only $32,400 a year. Various attempts have been made, during the last ten years, to have the appropriation increased, but in vain, and there is no hope at present of getting any more from the State. — *E. Richtenberger in the Revue Bleue.*

COMMUNICATIONS

[*The editors cannot pay attention to demands of correspondents who forget to give their names and addresses as guaranty of good faith; nor do they hold themselves responsible for opinions expressed by their correspondents.*]

INFORMATION WANTED.

NEW YORK, N.Y., June 15, 1894.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — Will you kindly inform me through your paper if the Polytechnic Club, of New York, has held meetings this spring and where such meetings have been held, if any.

Yours truly, A. MITCHELL DUNCAN.

EXHIBITIONS

BOSTON, MASS. — *Annual Summer Loan Exhibition of Paintings*; *also, New Accessions to the Print Department:* at the Museum of Fine Arts.

CINCINNATI, O. — *Exhibition of the Cincinnati Art Club:* at the Art Museum, May 17 to June 30.

NEW YORK, N. Y. — *Twenty-sixth Annual Spring Exhibition:* at the Metropolitan Museum of Art, opened May 8.

Group Exhibition by American Painters — William M. Chase, J. Alden Weir, Childe Hassam and others: at the Galleries of the American Fine Arts Society, 215 West 57th Street.

NOTES AND CLIPPINGS

FAMOUS ECHOES IN BUILDINGS. — One of the most remarkable echoes known is that on the north side of Shipley Church, in Sussex, Eng., which distinctly repeats twenty-one syllables. In the Abbey Church, St. Albans, Eng., there is a curious echo — the tick of a watch may be heard from one end of the church to the other. In Gloucester (Eng.) Cathedral, a gallery of an octagonal form conveys a whisper across the nave seventy-five feet. In this gallery is the following inscription:

"Doubt not but God, who sits on high,
Thy inmost secret prayers can hear,
When a dead wall thus cunningly
Conveys soft whispers to the ear."

"In the Cathedral of Girgenti, in Sicily, the slightest whisper is borne with perfect distinctness, from the great western door to the cornice behind the altar, a distance of 250 feet. By a most unlucky coincidence, the precise focus of divergence at the former station was chosen for the place of a confessional. Secrets never intended for the public ear thus became known to the dismay of the confessors, and the scandal of the people, by the resort of the curious to the opposite point, — which seems to have been discovered accidentally, — till at length, one listener having had his curiosity somewhat overgratified by hearing his wife's avowal of her own infidelity, this tell-tale peculiarity became generally known, and the confessional was removed. In the whispering gallery of St. Paul's, London, the faintest sound is faithfully conveyed from one side to the other of the dome, but is not heard at any intermediate point. In the Manfroni Palace, at Venice, is a square room about twenty-five feet high, with a concave roof, in which a person, standing in the centre and stamping gently with his foot on the floor, hears the sound repeated a great many times; but, as his position deviates from the centre, the reflected sounds grow fainter, and, at a short distance, wholly cease. The same phenomenon occurs in the large room of the library of the Museum at Naples." — *Boston Herald.*

PROPOSED INSTITUTE OF ART HISTORY. — A circular has been issued on the part of a number of the leading gallery directors and art historians of Europe, proposing the foundation of an Institute of Art History, on lines somewhat analogous to those of the German Archæological Institute at Rome. The main objects of such an institute are described as being, (1) the establishment of the richest and most systematic collection possible of materials for the study of Art History, in the shape alike of books, photographs, and other reproductions of all kinds; (2) the appointment of a resident director qualified to organize the library and collections, guide students in their researches, and stand as a kind of official head and leader of these studies. The place designated as the most appropriate centre for such an institute is Florence, and it is proposed to attempt to make a beginning by means of private donations and subscriptions, before appealing for aid in the shape of Government subventions. Among the signatories of the prospectus are Dr. Bede, of Berlin; the Commendatori Cavalcaselle and Gnoli, of Rome; M. Hymans, of Brussels; Professor Justi, of Bonn; Professor Lutzow, of Vienna; Professor Venturi, of Rome; Professor Schmarzow, of Leipzig; Dr. Bayersdorfer, of the Munich Gallery, and Dr. M. G. Zimmerman. The three gentlemen last named are the provisional Executive Committee for carrying out the scheme. — *Philadelphia Telegraph.*

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Trees vs. Wires.— The newspapers lately contained an account of a lawsuit which has interest for everyone who believes that the owner of a tree has a right to complain when it is recklessly mutilated. The employés of a telephone company were stretching wires along the road which skirts the property of Mr. George W. Hawkins, near Newburgh, New York, and, in doing so, they disfigured half a dozen spruce trees, which had been planted by his father, by cutting off the branches. No consent to this mutilation had been given by the owner of the trees, and the linemen, as usual, had used their saws and axes without mercy. Dr. Hawkins sued the company for $600, estimating the damage at $100 a tree. The jury gave a verdict for $500. Under the provisions of the code in that State, Mr. Hawkins's lawyers then moved that a triple judgment be made, and the Court astounded the defendants by granting this, and increased the judgments to $1,500. It is to be hoped that the higher courts will confirm this judgment, and hold that a growing tree has a value beyond the mere amount of timber it contains, and that the owner has a right to watch its growth and enjoy its beauty, and to derive pleasure from its associations. The courts should take into account that a tree cannot be replaced in many years, and the wanton destruction of such property ought to call for exemplary damages. Ever since the country was settled we have been learning how to cut down trees, but it is high time that we learn the real value of those which have escaped and stand where they can delight us by their beauty and refresh us with their shade. The decision of this Orange-County Judge is a wholesome one, and such decisions are needed to teach the linemen of telephone and telegraph companies a lesson, which will make them more cautious about invading private rights.— *Garden and Forest.*

Overheated Electric Globes — A fire occurred in the business portion of Victoria, B. C , on the 5th inst. Fortunately the loss was only $15,000, and the records would show the origin "unknown," but for experiments made after the fire was extinguished. In the upper story of a dry-goods house, several thirty-two candle-power incandescent lights were installed. One of the lights was connected with a long insulated wire, and several feet of spare wire allowed the moving of the light from one portion of the room to another. Through ignorance, or carelessness, the globe was laid on a pile of goods. The fire occurred shortly after the light was turned on at the power house, which goes to prove that the globe was placed on the goods during the day. The tests were made in the room where the fire originated, and were reported in the Victoria *Times* as follows: "There is no longer the slightest doubt as to how the fire started, as two tests have shown that the incandescent light will ignite cloth. Last evening, in the presence of Mr. Hutcheson, Chief Deasy, representatives of the *Times*, and a few others, a child's woolen hood was tied around the 32-candle light, the latter having been turned for ten minutes previously. Steam came from the wool almost immediately, and then smoke. At the end of eight minutes the hood was on fire and the globe burst. A similar test was made the evening before, and the cloth ignited in six minutes. Wool is the least inflammable of fabrics, and the test last evening was as severe as could be desired. All danger in this connection can very easily be avoided, either by hanging the globes free from anything that will take fire, or by placing fireguards around them.—*Fire and Water.*

The Ferris Wheel.— Preliminary work incident to taking down the Ferris Wheel on the Midway Plaisance has been begun. This consists of placing false work, engines and hoisting apparatus. It will take ten weeks to take the wheel to pieces. The car that was used for carrying the Krupp gun will be used for the seventy-ton axle. The material will be taken in five trains of thirty cars each to New York City. There are 3,000 tons of metal in the wheel and 500,000 feet of timber is needed for the false work. Taking the wheel down will be more dangerous than putting it up. Only one life was lost in erecting the big attraction. The expense of taking down, moving, and rebuilding the wheel will be $150,000. In New York it is to be placed at Thirty-seventh Street and Broadway. Old Vienna will be reproduced around it. Here the wheel had 3,000 electric lights; in New York the number will be doubled. The old Ferris Wheel Company goes out of existence and a new company, composed of New York men, has been formed. Superintendent L. V. Rice has charge of the removal. During the Fair the wheel went around 10,000 times, and carried 2,000,000 passengers. The largest single load was carried October 19, when at 12.30 o'clock, 1,768 people were in the cars. The largest day's business was October 10, when 38,000 people were carried. October 9, 10, and 11 there were 114,000 passengers, the largest average for any three days.— *Chicago Tribune.*

The Present Status of the Panama Canal Enterprise.— The Panama Canal was inaugurated 1879, and digging actually commenced in 1881. In March, 1889, work ceased owing to lack of funds. Up to the stoppage of work in March, 1889, 48,400,000 cubic meters (17,085,200,000 square feet) of earth and rock had been removed, leaving a balance of 30,000,000 cubic meters to be removed for an eight-lock canal, as proposed. The total length of the proposed canal was forty-six and one-third miles, depth twenty-five feet, width at bottom, seventy-two feet, and at surface of water 124 feet. The following figures taken from the report presented to the President and Judges of the Court of the Seine, on July 25, 1890, by the liquidator, M. Monchicourt, will show the greatness of the enterprise, etc.: Total expenses at Panama, £31,330,937 ($156,654,685); total expenses in Paris, £15,628,066; purchase of Panama Railway shares, £3,730,727; payments of the Civil Society of Obligations for the lottery scheme, £1,290,587; payment to the Colombian Government, £98,203; total, £52,078,520 ($260,392,600). It is estimated that the total loss has been more than $50,000,000, and that, to complete the work, quite $30,000,000 more would be required.— *Boston Transcript.*

A Suez Indictment against De Lesseps.— A despatch to a London news agency, from Cairo, says that a criminal indictment has been lodged at Paris on behalf of Egyptian notables, against Count Ferdinand de Lesseps and the early directors of the Suez Canal Company, for the misappropriation of money, the claims amounting to several million pounds, based upon documents given under the seal of Said Pasha, then Viceroy of Egypt, by which, in accordance with the acts of concession, he conferred founders' and ordinary shares upon the members of his army and household.—*N. Y. Evening Post.*

A Soporific Paint.— A rancher on Vashon Island, Washington, has his house painted more expensively than any other house in the State. Last fall, he found a box which contained about 200 pounds of what he thought was a fine quality of fireproof paint, floating in the sound. The paint was packed in small tin cans and bore a foreign label, and, as it had cost him nothing, he thought he would paint his house with it. The house is now painted inside and out, and, in doing so, the greater portion of the paint was consumed. The rancher has discovered, much to his sorrow, that, instead of fireproof paint, he has his house covered with about $3,000-worth of smuggled opium, which was thrown overboard by smugglers.— *Oregonian.*

Effect of Heat on Lead Pipes.— Text-books contain a great deal of useful information, no doubt, but they fail to give a vast amount of knowledge which is required in practice. Where, for example, do we find any mention of the effect of heat on lead pipes? In the case of a recent electric light ng installation, exhaust steam by some means found its way into the ventilating and soil pipes leading to the drains. One of the first evidences of this was found in the warping of all lead pipes so used. It appears that the heat of the exhaust steam caused the lead pipes to expand and warp, but when the steam was entirely prevented from entering the drains the lead would not contract, and all such pipes had to be straightened by hand. This is a point which embryo engineers would do well to keep in mind, as each time the pipes were heated they expanded, but in no case did they show any signs of coming back to their normal condition.— *Industries and Iron.*

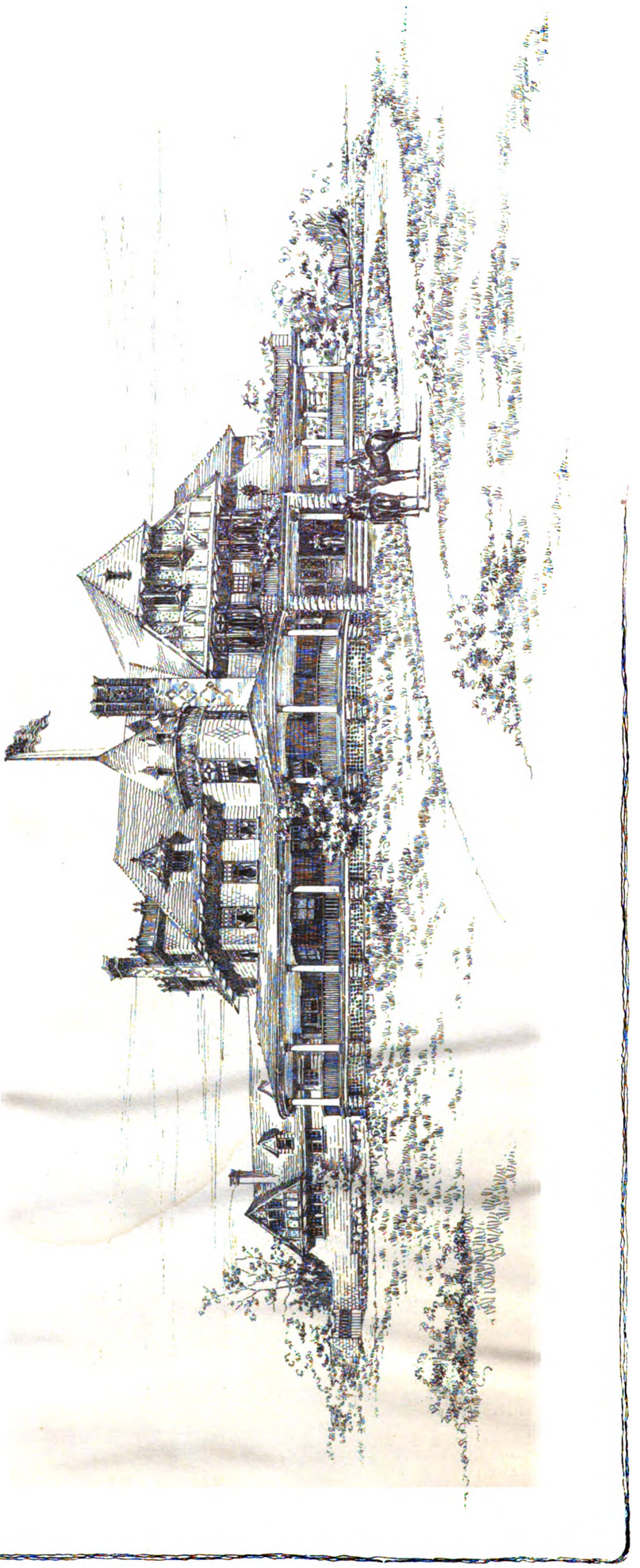
Statues for the Library of Congress.— The new Library of Congress at Washington has two porches which are to be decorated with figures of famous writers of the past; each figure to stand between columns that support the porches. On one side there are four, on another side there are five openings to be decorated with likenesses; these nine statues are as follows: Demosthenes, Dante, Franklin, Goethe, Macaulay, Scott, Irving, Emerson, and Hawthorne, a band in which the only doubtful names are those of Macaulay and Franklin, since neither was a writer of the first rank. These nine statues have been given to three sculptors. Mr. Herbert Adams will model Demosthenes, Dante, and Scott; Mr. Jonathan Hartley will furnish Irving, Emerson and Hawthorne, and Mr F. Wellington Ruckstuhl is to prepare likenesses of Goethe, Macaulay, and Franklin. It is of good augury when Government officers begin to ask the aid of our sculptors to decorate public buildings at Washington.— *N. Y. Times.*

Overhanging Tree Branches.— A very important decision has just been given by the Court of Appeal in the case of "Lemmon *v.* Webb" (*Times*, May 9), as to the legal position of overhanging branches of trees. The parties were adjoining landowners, and on the boundary of the plaintiff's land there were some fine elm and oak trees, with branches overhanging the defendant's ground. The defendant, for his own reasons, cut off some of these larger branches, which were proved to be over twenty years old — and of the existence of which he had been aware for the last fifteen years — and he did so without first giving notice to the plaintiff. At the trial, before Mr. Justice Kekewich, the Judge held that the inconvenience caused by the overhanging of a neighbor's tree must be treated as a nuisance of omission, and, so that, as there was no proof of immediate damage from the state of these branches, the defendant was wrong in having cut them down without first giving reasonable notice to the plaintiff, calling upon him to abate the nuisance, and, therefore, he must pay £5 and the costs of the action. From this ruling the defendant appealed, and it has now been reversed, Lord Justice Lindley giving a considered judgment upon the whole principle at issue, which will be useful for future guidance in similar disputes. It had been argued that the owner of a tree which was growing out over his neighbor's land, could, in fact, acquire an easement in the overhanging branches by prescription, in the same way as he can by overhanging eaves or the like. But the Court declined to adopt the analogy, which, indeed, falls to pieces when applied. For a man has no right of action for trespass against his neighbor in respect of branches overhanging his land, as he has with regard to any projecting building. There is no doubt whatever that a landowner can cut down branches overhanging his land, and the question of whether he had first to give notice calling upon his neighbor to do so, depends upon the nature of the right. If there is an absolute right to cut down such branches, and if no easement can be acquiescent in the natural growth of a tree, then it follows that the point does not depend on the law as to nuisances, and that no notice need be given. After a very learned and exhaustive inquiry into the law for centuries, the Courts of Appeal have now decided that the owner of a tree has no right to prevent a person lawfully in possession of land, into or over which its roots or its branches extend, from cutting away so much of them as projects into or over his land, and the owner of the tree is not entitled to notice unless his land is entered in order to effect such cutting. The clear right of the owner of the land to free it from obstructions above or below is not dependent upon his giving any notice. At the same time, it is better to give notice, as common courtesy would suggest, for if the case goes to Court, the judge's discretion as to costs may be used, as it was here, against the party whose unneighborly action brought about the dispute.—*Building News.*

S. J. Parkhill & Co., Printers, Boston, U. S. A.

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SKETCH FOR
PROPOSED COUNTRY CLUB
EXPOSITION
FOR THE CORNELL ISLAND
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BOSTON CITY HOSPITAL

PATHOLOGICAL B^DG AND MORTUARY CHAPEL

EDMUND M. WHEELWRIGHT · CITY ARCHITECT

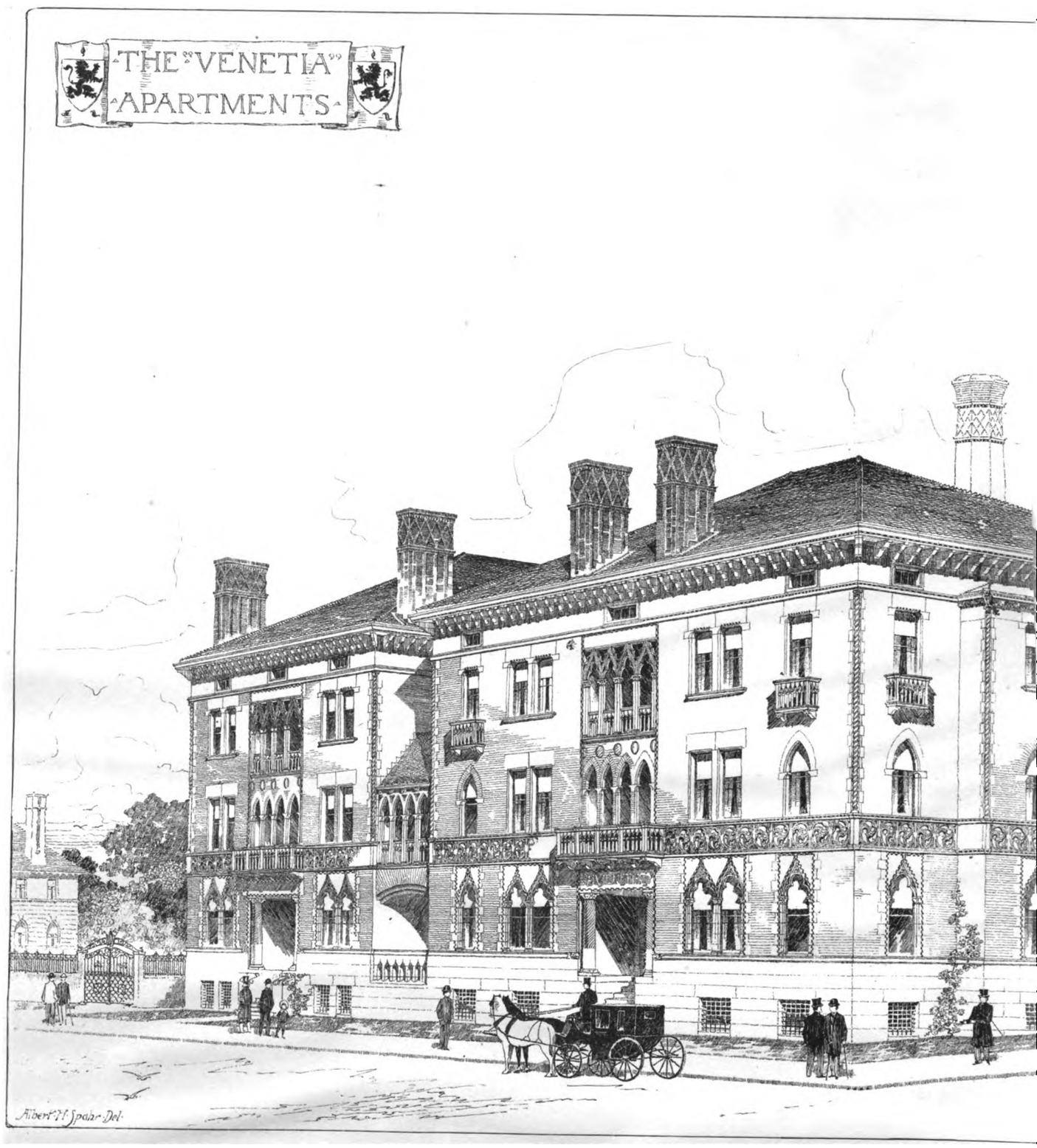
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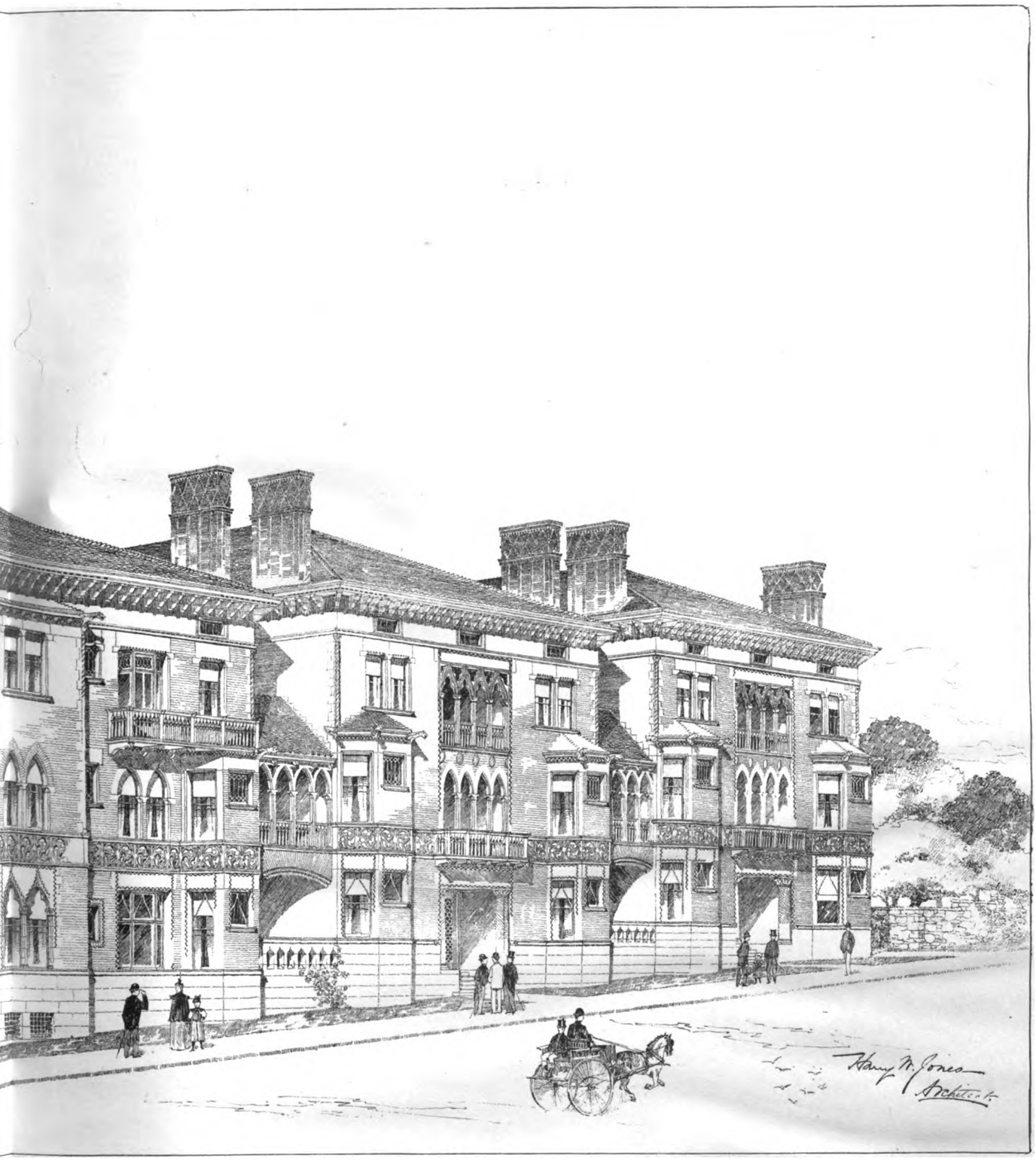
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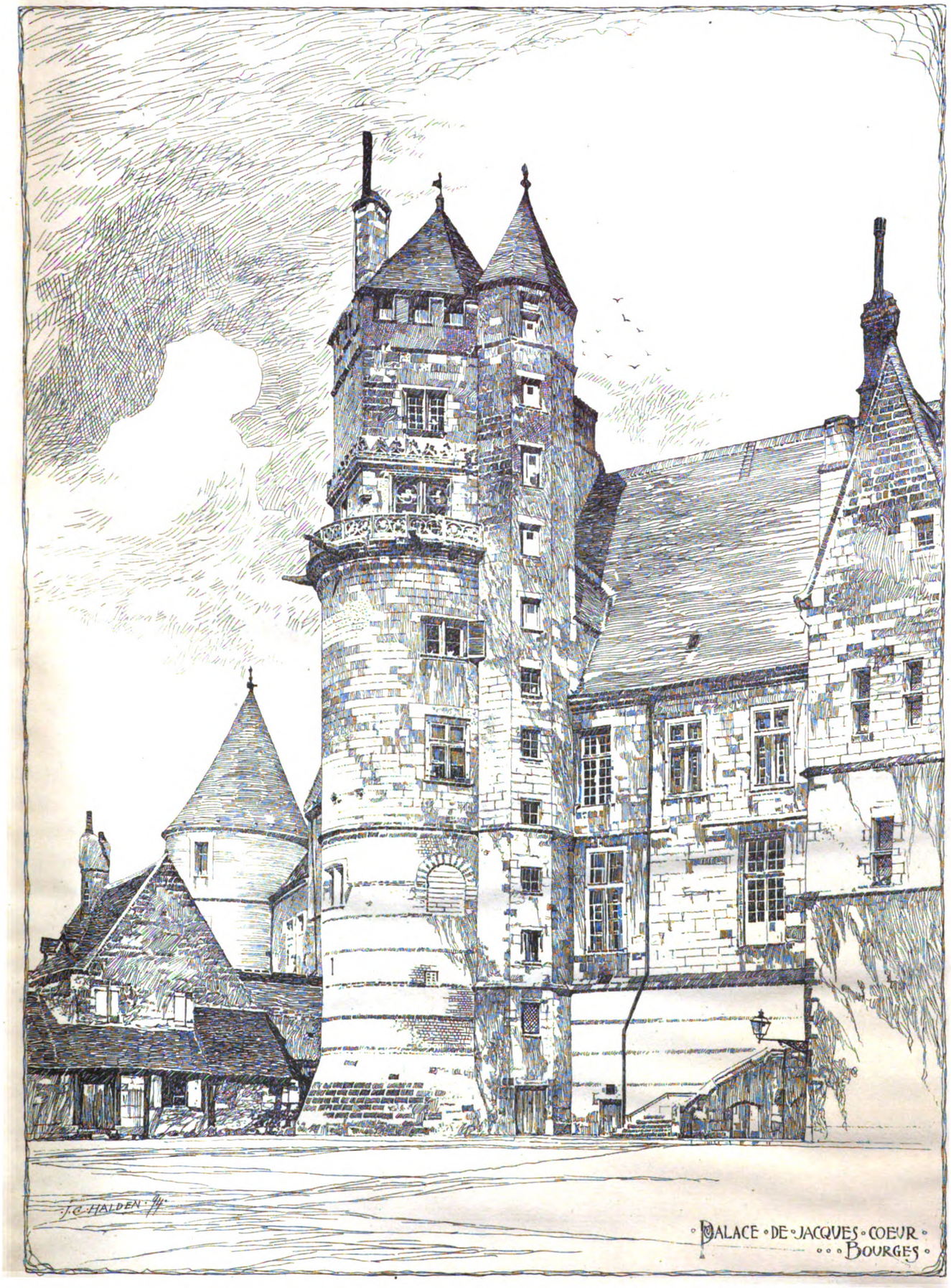


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DESIGN FOR A COUNTRY HOUSE
AT RIDLEY PARK, PA.
Rankin & Kellogg, Archts.
1024 Walnut St. Phila.

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THE AMERICAN ARCHITECT AND BUILDING NEWS.

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THE fact that much less than a majority of the competitors who submitted designs for the New York City-hall have sent us, in consequence of the suggestion we made on May 26, an authorization to take judicious action in their behalf in hastening some definite action on the part of the authorities, may be taken as indicating either that most of the competitors have lost all interest in the matter, or that they prefer to take individual action rather than to join hands with their fellows. That some certainly take this latter view of the matter is proved by the report in the daily papers that the Messrs. Audsley have brought suit against the Mayor and Building Commission, but whether for an award of one of the prizes or for damages we do not know. The three expert advisers to the Building Commission have presented their bills, of fifteen hundred dollars apiece, according to the terms upon which they accepted office, but we doubt if these demands have been liquidated yet, for the balance left of the appropriation placed at the command of the Commission is said to be less than one-third of the sum of the experts' claims. The agreement made by the City, through its officials, with the several competitors was no less specific and binding than the agreement made with the three experts for their services, and it would seem plain that, if in the course of time the competitors learn that the experts' bills have been liquidated, they may feel assured that eventually the prize money will be distributed to five of the competing architects.

LA REVUE INDUSTRIELLE, in an interesting article on the disposal of garbage, a subject which is now attracting attention all over the civilized world, quotes an article in which we spoke of the American utilization processes, but finds it difficult to believe that the value of the residues obtained can be so considerable as our statements indicated, although, as it acknowledges. they are confirmed by those of other American authorities. It will, therefore, be interesting, we hope, to a considerable number of our readers to know something of the progress which has recently been made in what we believe to be the great and beneficent science of utilizing the waste products of human life. The process of garbage disposal is probably carried on now with greater perfection in St. Louis than anywhere else in the world. In the new establishment, just completed there, at a cost of nearly a quarter of a million dollars, by the company which holds the contract for disposing of the garbage of the city, the carts, bringing the material, ascend an inclined plane to the third story of the receiving building, where they discharge into enormous vertical cylinders, which are surrounded by steam-jackets. Superheated steam is forced into the jackets, and the water, which constitutes from seventy-five to eighty per cent of the garbage, is thus evaporated, or rather, distilled off, the vapor being condensed, and the condensed water, which is perfectly harmless, and even drinkable, allowed to run off to the sewer. At a certain stage of the drying, naphtha is pumped into the cylinders, and allowed to remain there for thirty or forty hours. This dissolves out all the fats, oil and grease from the mass. Other chemicals are said to be mixed with the naphtha, but this is probably for the sake of mystification, the naphtha alone being quite sufficient for the purpose. After the proper time has elapsed, the naphtha, with its dissolved oil, is pumped out again, into stills, where it is distilled by steam heat, the volatile naphtha being allowed to run back from the condensers into the storage tanks, while the fat, which is left in the stills as a brown, oily mass, is drawn off into barrels. It may be bleached, so as to be perfectly white, and it is said that the pure and delicate Ivory soap, which has gained such popularity all over the country, was originally made of refined garbage grease, before it was found advisable to use cotton-seed oil instead. After extracting the grease, the residuum in the cylinders is dried a little more, the last vestiges of naphtha being driven off in the process, and is then removed, through a door at the bottom. It is now a brown mass, free from all unpleasant odor, and apparently dry, although it still contains five or six per cent of water. As it has not been heated sufficiently to cause destructive distillation of the solid portions, it contains practically all the nitrogen of the fresh garbage, with, of course, all the alkalies and phosphates; and, after grinding coarsely, and packing in barrels or bags, it commands a ready sale all over the United States. The dealers usually analyze a sample, and fix their price mainly in accordance with the proportion of nitrogen found in the sample; but the St. Louis "garbage tankage," as it is called, readily brings in New York and Boston from nine to twelve dollars a ton, and the demand for it far exceeds the supply.

IN the United States, except in New York, household garbage is usually collected separately from the ashes, strict regulations prohibiting the placing of the two things in the same receptacle; so that the utilization of the material is much easier and more profitable than if, as in England, organic and inorganic wastes were mixed together; but a certain number of tin cans, and fragments of glass and other mineral substances, are found even in the best garbage. These may, and in most cases are, picked out by hand before the garbage is put into the drying cylinders; but it is much better to leave them until the mass is dried and sterilized, and, with the best utilization plants, this is done, and the glass and metal is picked out of a clean, dry, inodorous heap, instead of a reeking pile of decomposing swill. The glass and tin are separated, and sell readily for five or six dollars a ton, so that the labor of picking them out is paid for by the money received for them, and there may, in some cases, be even a profit in the operation. In New York, where ashes and garbage are mixed together, carried out to sea in scows, and dumped, ninety thousand dollars a year has been regularly paid for several years by a contractor, for the privilege of picking over the contents of the scows before they start on their voyage. It may be imagined that if a man is willing to pay three hundred dollars a day for the privilege of picking out the glass, iron and tinware from the New York garbage, it must be worth a good deal more than the cost of the labor involved; and, that the contractor has a sharp eye to values is indicated by the fact that this year, in consequence of the financial troubles, which have made people more careful of their old bottles and tin cans than usual, he has found his revenue so much curtailed that he has only been able to offer seventy-five thousand dollars, and his contract for the year runs at that rate. Besides the inorganic constituents of the garbage residuum, which may be considered, notwithstanding the example of New York, to be worth only the cost of separation, there remain, as the fruit of the utilization process, the grease and the tankage. The value of the tankage we have already mentioned; and for each ton of tankage there is collected grease to the value of about two dollars. Unquestionably, the naphtha tanks, and pumping and distilling apparatus, add much to the cost of treatment, and the expense of the plant; but the price received probably pays the cost of removal, and the value of the dry tankage, as a fertilizer, is increased by the separation of the

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grease. The quantity of water contained in the fresh garbage varies considerably with the season; but, as an average, one hundred tons of garbage, as delivered from the carts, yields sixteen tons of dry tankage, ready for sale. Supposing this to be worth one hundred dollars, which is, we believe, about the usual price obtained for it at the works, and the grease extracted from it to be worth thirty-two dollars, it will be seen that the daily income of an establishment capable of treating this amount of material, which is, we think, under the capacity of the St. Louis company's works, very considerable, especially in view of the fact that the raw material is regularly delivered, free of charge, into the drying cylinders, and that, although the plant is costly and complicated, the work is done mainly by pumps and stills, with very little aid from manual labor. Nevertheless, it is, we believe, true that no establishment in the United States has ever been able to take city garbage and treat it at a profit, without the aid of a subsidy from the city for taking care of it. Several companies, attracted by the theoretical advantages of the operation, have made contracts to take garbage without charge, but have, we think, invariably come to grief. In some cases, they have suffered from irregularity in delivery, which, with a large plant, is a serious matter; and it may be presumed that the time will come when city garbage will be sought for as a valuable substance; but that time has not yet arrived. In St. Louis, the city pays the company, on a long contract, $1.80 per ton, or thereabout, for taking the garbage, and finds its reward in the efficient and inoffensive manner in which it is disposed of. In other cities, using similar systems, rather less is paid, but the treatment is not conducted with quite the same advantages.

THE *Builder* administers a sharp, but well-deserved editorial rebuke to the authorities of a certain school, who invited competitive designs for school-buildings, stipulating in the programme that they should not cost more than eighty-five hundred pounds. The designs were sent in, judged by a professional assessor, one selected, and the others returned. Some time afterwards, it appeared that the execution of the selected design would cost thirteen thousand pounds, and it came out, through one of the school officials, that it was necessary to cut it down considerably to get it carried out even for that sum. Some of the competing architects, on hearing of this, joined in a letter to the officials, calling their attention to the reports, asking whether the thirteen thousand pounds covered an extent of building not contemplated in the original programme, and pointing out that if a plan had been selected which cost nearly twice as much as the limit of cost, in preference to the designs which had been made in conformity with the stipulated limit, a grave injustice had been done to those competitors who had conscientiously observed the requirements of the programme.

TO this communication the school authorities replied in the lordly style which was once fashionable in addressing architects, saying that they were "unwilling to enter into any controversy on the subject." This supercilious dismissal of the petitioners by no means pleases the editor of the *Builder*, who calls the attention of the officials to the fact that "a charge such as is made in the letter of the four competing architects is not to be disposed of in that light-hearted manner;" and demands from them a further explanation, in the name of "the other competitors and the architectural profession." It is with much satisfaction that we observe this manifestation of decent self-respect among English architects, who have rather lagged behind in the movement which has, within the last fifteen or twenty years, so transformed the relations of architects and their clients; but, to our mind, the matter should not be allowed, as we fear it will, to rest with the indignant protests of the *Builder* and the competing architects. The place for bringing the perpetrators of such frauds upon architects to account is in the courts. People who delude architects into thinking that they want designs for a building to cost eight thousand pounds, and, after getting them, throw them all aside, and take one that costs thirteen, may rest assured that, whether they are willing "to enter into any controversy" or not, the judge and jury will be, and that the controversy, once brought fo r e them, will not be dropped until substantial damages ve been awarded to such persons as the court finds to have en defrauded and deceived. A few cases of this sort, carried jud g ment and execution, would do wonders in promoting the decent treatment of architects. That the law in regard to them has not been settled before this is probably due to the timidity of architects, who dread to see their scanty incomes disappear into the capacious pockets of lawyers. In France, the expenses of such a suit would be defrayed by the Defense Mutuelle Society, but neither in England nor in this country, unfortunately for the profession, does such an association exist.

A BALLOON ascension took place recently, at Lyons, which ended in a rather curious law-suit. M. André, Director of the Observatory of Lyons, arranged to make an excursion in a balloon, taking with him his assistant, M. Le Cadet. They engaged for the purpose a balloon belonging to a professional aeronaut, M. Pompéien, who willingly lent it to them, and went with them as engineer of his craft. The scientific instruments were put on board, and the party set sail. They were prosperously floating in the air when a violent gust of wind struck the balloon, driving it into the village of Châtillon, where they endeavored to make a landing. In the attempt, the balloon struck a tree. The instruments were damaged by the shock, and André and Pompéien seriously injured, and the balloon was torn; and, to make matters worse, Le Cadet, finding himself on the ground, but entangled in the ropes, and in danger of being carried off again, drew his knife, and slashed holes in the balloon, so as to allow the gas to escape. When the parties recovered, they began mutual law-suits, André against Pompéien, for having, by his unskilful management, caused damage to the valuable instruments, in addition to personal injury; and Pompéien against André, for having, as he asserted, obstructed the measures which he was endeavoring to take for the safety of the party, thereby causing the accident, and for having also, through Le Cadet, his servant and agent, without cause, inflicted great damage on the balloon.

THE suits were carried up to the Tribunal of Lyons, which tried them both together. In its decision, the court said that the evidence, all of which was given by the interested parties, who were the only witnesses of the occurrence, was too contradictory to prove the ground of a judgment; but that, as matter of law, neither party could be held to have been guilty of the lack of due skill which carries with it legal responsibility. "The art of the aeronaut," said the court, "is not yet sufficiently advanced to enable us, unless under exceptional circumstances, which do not apply to this case, to characterize as unskilful the actions of the aeronaut, or of those whom he has undertaken to pilot through the air; on the contrary, it is to be presumed that those who have undertaken these aerial excursions, acting in presence of natural forces which they could not entirely control, have in good faith done what they supposed at the moment necessary to lessen the common danger; in a word, that they have acted under the dominion of those extraordinary circumstances which exclude all responsibility." In accordance with this view, which is certainly very neatly expressed, the court rejected the claims of both parties, and condemned André to pay one-third the cost of the suit, and Pompéien two-thirds.

THE ruins which were uncovered by the draining of Lake Copais, in Bœotia, have been further investigated, and prove to be of the same character as the remains of Mycenæ. They show the character of a strongly fortified place, and, taken in connection with the chain of small forts, some of which are still visible, and about which Mycenæan pottery is found, extending toward Orchomenos, they indicate that the Minyæ, or whoever else they may have been who inhabited them, had a regular system of fortifications, connecting this city, which is known to the present inhabitants of the country as Gulàs, but which the *Builder* thinks to be identical with Arne, the royal city of Athamas, with Orchomenos and the sea. To the romantic archæologist, these ruins, if they are really those of Arne, will be interesting as being those of the place from which Phrixus and Helle started on their ride through the air to Colchis, on the back of the ram with the golden fleece. However disposed the young princes and princesses of the time may have been to such startling adventures their fellow-citizens of less exalted rank seem to have been of a very practical turn of mind. The whole region shows traces of an elaborate system of dykes and dams, and the sons of the Sea and the Storm-wind apparently carried on scientific irrigation with great success.

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FRENCH STYLES OF ARCHITECTURE. — II.

AN HISTORICAL SKETCH.



Fig. 5. From a Vase by Coysevox, Versailles.

IT is fitting, as well as just, since reference has been made to the artist to whom we owe the nucleus of Versailles — a small palace swallowed up in the great — to call attention at the same time, and in accordance with the testimony of this same Sauval, to the praiseworthy purposes of Henri IV, the first of the Bourbons; he succeeded the Valois princes whose exhausted treasury could no longer even keep up work on the unfinished palaces, nor support the artists, nor give encouragement to the arts.

"The king had intended to have, at his own palace, all sorts of manufactories and the best artisans of each profession, as much for the purpose of maintaining them at Paris as to employ them at need. . . ." He wished to establish a nursery of artists to people France with. He had a colony of them in a gallery of the Louvre; above them were also lodged sculptors, architects and upholsterers. These various apartments had been designed by Henri IV for the most renowned artists; for his aim was to *house in the Louvre the greatest lords and the most excellent masters of the kingdom, so as to ally wit and the fine arts with nobility and the sword.* The statement somewhat transfigures to our eyes the *diable-à-quatre*, the brisk gallant whose memory a vain people cherishes because of his paternal solicitude for the *pot-au-feu* of his humblest subjects.



Fig. 6. Decoration of a Ceiling at Versailles.

The king, who has been badly enough abused by Michelet, is seldom credited with having taken up, from such lofty and patriotic motives, the rather confused and poorly executed idea of François I; or with having paved the way, with such intelligent zeal for the artistic advent of the next reign. Sully, spoiled by his narrow economy, merely fettered the generous ardor of his master. Richelieu was especially anxious to

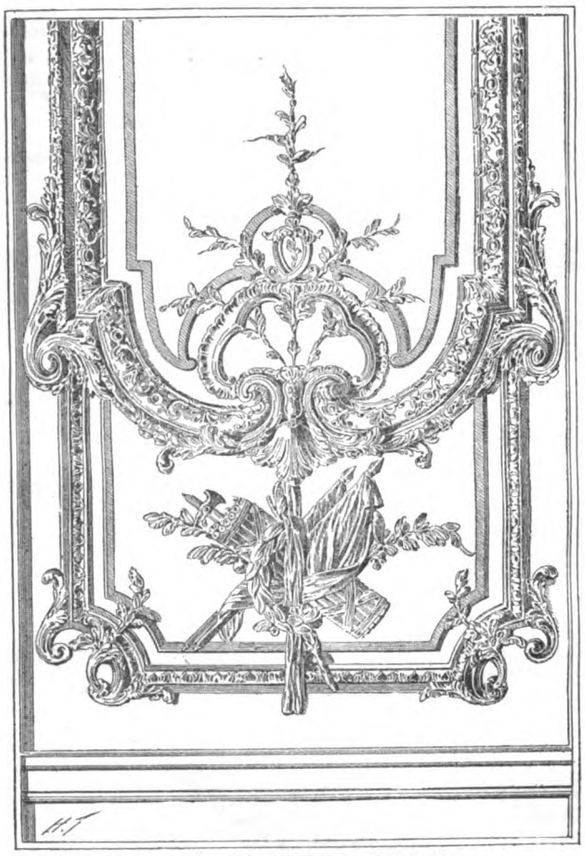


Fig. 7. Panel in the Château of Versailles.

emphasize the obliteration of the power of the throne before his red hat; he monopolized Le Mercier, who nevertheless enlarged the Louvre, but who erected a little château at Versailles, and a grand palace at Richelieu in Poitou.

With Levau and d'Orbay, Mazarin reared the palace of the Quatre-Nations, the finial "*pots-à-feu*" of which alone characterize the ornamental style — it is little. At Versailles Louis XIV paid less attention to æsthetic philosophy than to personal splendor. While preserving his father's château, the cradle of his own royal infancy, he wished to enlarge it so as to entertain his court there, and to decorate it in imitation of what he had seen at Vaux, at Maisons and elsewhere. He

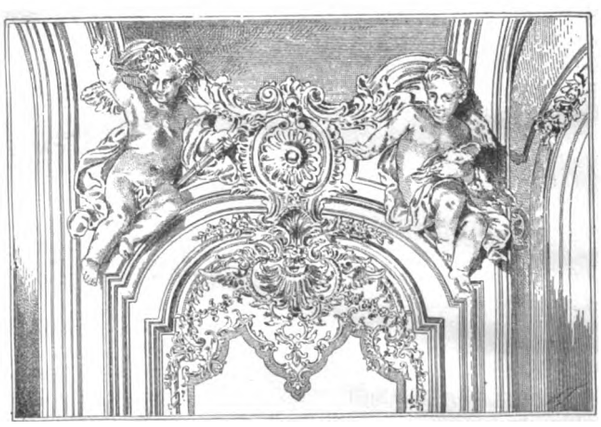


Fig. 9. Ceiling of a Salon of the Hôtel de Soubise.

took the initiative, allowing no one whatever the right to preach to him by example. And it was, in fact, for the example, that, with Levau and Le Nôtre, taken from the disgraced Fouquet, with Le Brun, Mansart, Lepaultre, and a galaxy of

[1] From the French of E. Rivoalen, in Planat's *Encyclopédie de l'Architecture et de la Construction.* Continued from No. 965, page 133.

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great French sculptors, he made Versailles, the Trianon and Marly, incomparable museums, where the great lords and foreign princes came to admire the marvels of French art at its zenith, and which they copied more or less happily.

Masters in decorative compositions, who converted a garden-vase or a fountain-basin into a veritable monument, like the sculptor Coysevox, for instance, strove to imitate the serenity and plastic calm of the works of antiquity, and that even in the grotesque (Fig. 5). Is not this satyr's head embossing the voluted handle of a marble vase in the park of Versailles a combination of the picturesque forms and the Gallic, Rabelaisian expression peculiar to the French school, with the decorative, monumental placidity of which antique sculpture furnishes such valuable example? Where can we find anything finer and at the same time more significant? How perfect the balance of light and shade! What can really be more beautiful than this sort of grotesque mask which, if differently treated, might make an ugly spot on the sides of the noble vase?

In the interior of the main palace, certain ceiling (Fig. 6) and wainscoting (Fig. 7) frames borrow from the gilt glazing, dulled by time, but bringing out all the refinements, a powerful tonality, devoid of monotony, which gives life to the marble revetments, catches the light and deepens the shadows. And what a tranquil aspect, what clearness in design and composition result from this perpetual subordination of the delicate, shaded details to the effect of the masses! What stable traditions, what systematic study, what discipline, as it were academic, could have given these artists, designers or builders, such judgment, and such a thorough knowledge of their business?

The massive vaults of the seventeenth century, the energetic compositions of Lepaultre or his successors (Fig. 6), the orders of solemnly rectilineal pilasters, with their projecting capitals and dusty cornices shading the ceilings, are succeeded by covings delicately ornamented with mouldings, and by daintily painted ceilings. The panels, with a white background, are framed (Fig. 7) with bill-headed mouldings, enriched with fine arabesques, culots and volutes, trophies and cartouches; the whole constitutes, as it were, the well-balanced framework of a very rational decoration, for it accuses the structure, bringing out the pleasing features, but concealing the plastic or optical defects. Twigs or light branches are introduced, with an affectation of naturalness, and form a contrast, by this very means and by their fine silhouettes, with the strength and the quite conventional ornamentation of the more solid parts and of the frame around the spandrels. At Paris, Versailles and in the provinces, the courtiers, as we have said, hastened to imitate, more or less closely, the monumental magnificence of the "grand Roy." In the Faubourg Saint-Germain, Paris still preserves some superb specimens of these productions. But the provinces possessed no Mansart, or Blondel, or Perrault, nor even a Levau or Bullet. Native architects were employed, or none at all. In some cases, a master - mason was responsible for plans, estimates and buildings. Only the sculptors and painters had to be summoned from the great town to insure a sumptuous decoration to clothe the masonry and joiner-work. They took advantage of the liberty that the absence or incompetency of the architect left them. And, as each of these decorators endeavored to outdo the others, we find sometimes a surprising collection of very well treated parts in an absolutely incongruous whole. Such, for example, is the door of a mansion at Cambrai shown in Figure 8, whose coved impost overburdens the bay, and appears to be formed of two pieces, one of which, a disproportioned shell, would be suitable for a niche designed for a statue or vase; while the sculptured wooden doors, executed, perhaps, at Paris, might pass for a masterpiece — at least, in execution. The whole bay is too peculiar in disposition to indicate the conception of a master. The example, is, nevertheless, an interesting one, for it marks the close of the Louis XIV style and the beginning of the Louis XV. The moulded framings have a double



Fig. 8. Entrance of a House in the Rue de l'Arbre des Pois, Cambrai.

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curve and project prominently. Volutes, foliage and twigs are combined with slightly "*rocaille*" ornaments and are intertwined in a complicated manner.

But the shadows which are always carefully observed, from the high relief of the brilliant arrises to the delicate low relief of the twigs; the clearly dominant general ornamental disposition which accentuates the upper part of each wicket or false



Fig. 10. From a Room in the Hôtel de Soubise.

wicket; the sober decoration of all the rest of the woodwork, which is perfectly plain at the bottom, with smooth mouldings everywhere; all this make us foresee the maintenance of good taste and good traditions through the license of the coming style — that of the Regency and the reign of Louis XV.

In 1706, Boffrand, a pupil of J. Hardouin Mansart, was appointed to complete and decorate the interior of the Hôtel de Soubise (Archives Nationales), which Delamaire had begun for the cardinal bearing this name (Mariette, *Arch. fr.*).

The simple mediocrity of a conscientious, almost economical builder, was superseded by the luxurious taste and easy elegance of a master trained in the School of Jules Hardouin Mansart. The *salons* of the Hôtel de Soubise had, all proportions preserved, nothing to covet at Versailles. The well-known motive (Fig. 9) of the splendid frames adorning the piers painted by Natoire in the Salon Ovale, and repeated several times at the springing of the vaults, and at the top of the large panels, is already of the Louis XV style and yet is still of the Louis XIV; it is like the work of Lepaultre, but refined, saddened and softened in view of the coming Regency. It is sumptuousness itself, this decoration of Boffrand's; and the wonderful thing about it is not merely the graceful adjustment of the ornamentation, which is already tending toward the "*rocaille*," but also and above all the important and necessary rôle played by the allegorical *figure*.

The following motive (Fig. 10), adorning the coving of the ceiling in one of the sleeping-rooms, shows still better than

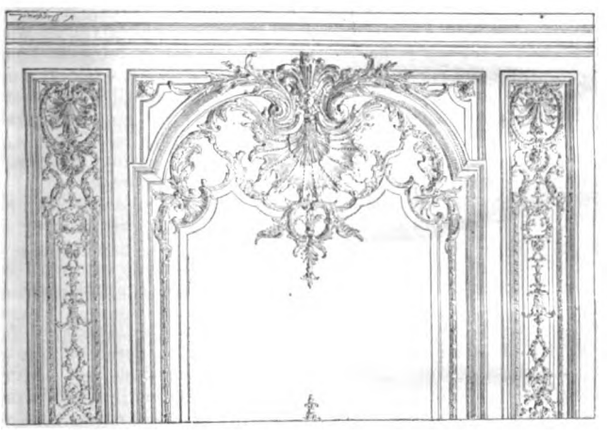


Fig. 11. Panel of a Room in the Hôtel de Soubise.

the preceding, the advantage of brilliant contrast which the artists of the period obtained from the figures in demi-relief; these are remarkable for their elegance and clever arrangement, forming on the sky of the ceiling the bouquet, as it were, the perfectly balanced and exceedingly decorative silhouette of these ornamental fireworks,

Sometimes, the figure is sharply separated from the decoration proper and is so supple as to play the part of painting in it. In Figure 12 we have a delicious allegorical bit, masterly and well joined to its surroundings, notwithstanding the frame

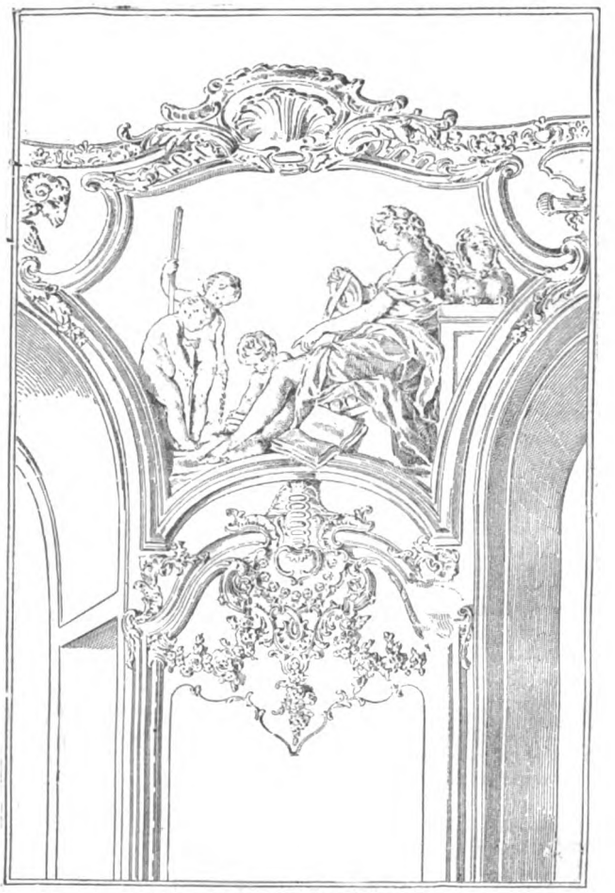


Fig. 12. Salon d'Eté, Hôtel de Soubise.

and perspective — notwithstanding the airy shadows of the relief; it dominates the rest nobly and gracefully. And the admirable figures require no other meaning, no other *raison d'être*, than is supplied by the decoration to which they give, so to speak, the tone.

In the decoration of the sleeping-room (Figs. 10 and 11), the mouldings are still strong; the beak-moulding is well disengaged from its counter-profiles. The palmettes and foliage are yet of the Louis XIV style, with conventional forms, as well as the ornaments running over the mouldings. But here are garlands and twigs of plants or flowers copied from nature; here are the shell-like shapes of

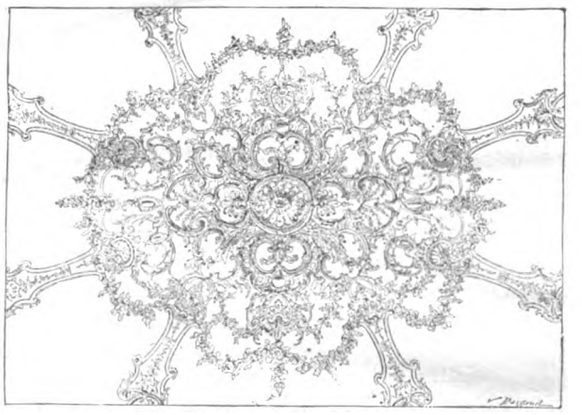


Fig. 13. Ceiling Rosace, Hôtel de Soubise.

the winged cartouch, the principal mouldings curving as a volute to adjust themselves to the cartouch or to the culots with their slanting palmettes; these novelties proclaim the Regency.

We come, then, to Figure 12 with the effacement of the beak-moulding of the "great wainscoting frames," when it is reduced

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to a simple cyma doubled by a bundle of fillets decorated with ribbons.

Then the *rosace* appears (Fig. 13) in the ceiling of *salons*, but figuring somewhat as a cupola with ornamental lattice-work and lace-like tracery supported in space by fine open-work



Fig. 14. Balcony of the Court of the Dragon, Paris.

balusters. Quite rare, considering its importance, this example of plant-form embellishment carried to the extreme of profuseness, shows how artists, in full possession of a new art, coquettish, but the result of successive transformations, were able to preserve, through the abundance that might easily have degenerated into confusion, the well defined character of the ornamental motive, the decorative *melody*. This *rosace* produces, in fact, the effect of a symphony whose

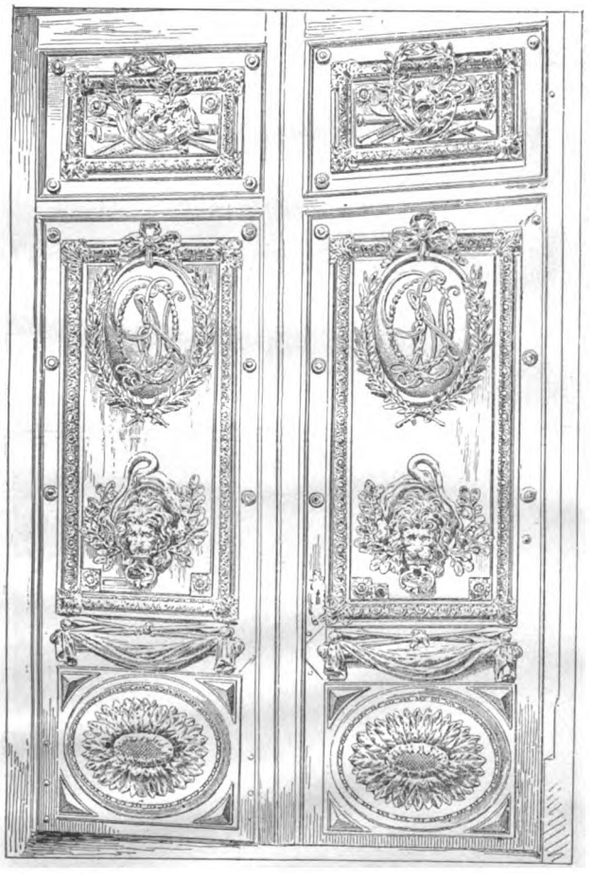


Fig. 15. Door, Rue Saint-Gilles, Abbeville.

complicated and rich scoring does not stifle the dominant thought, but leaves it clear and precise.

The sculptors of that time were indeed skilful as well as bold decorators. Under their broad sketching-chisels, fancies and fantastic notions take such natural and richly monumental shapes, that, even externally, the curving of the lines, and slashing of the forms, destroy neither the real simplicity nor the unity of the work: such, for instance, is the dragon (Fig. 14) which, surmounting a robust arcade, at the entrance to the modern Rue de Rennes gives us a glimpse of old Paris.

Then, however, as to-day, a work of art was not always a masterpiece. And though, as has been stated above, the execution is nearly always brilliant, direction was often wanting, and also unity of style. In the provinces particularly, we come upon architectural "bits," whose details indicate a skilled hand, a trained craftsman, but the *ensemble* of which is an assemblage of inharmonious parts, each, in style or character, differing widely from its neighbors. This is true of the entrance shown in Figure 15, the profusely sculptured doors of which bear, surrounded by Louis XIV mouldings, warlike trophies that recall the same period; then oval medallions and *rosaces* which bring us down to the beginning of the reign of Louis XVI; while the lions' heads of the knockers and the knotted "napkins" on the cyma of the basement are in Louis XV style (close of the reign).

[To be continued.]

THE PRACTICAL SIDE OF TRAVELLING IN EUROPE.[1]

IN deciding on any proposed tour, a certain amount of previous study is generally advisable and is to be obtained, either from those who have been there or from books.

As to books, it is very annoying on your return, to find that you have failed to see some well-known example in some place you have visited, and of which you have seen drawings in some book. Many illustrations of old work are sensational in character, and sometimes positively misleading, but have a value if you have seen the thing itself. The best plan of study to adopt is to arrange your notes under the names of towns, placed in alphabetical order, putting down the work of all styles, the name of the artist, and the description of drawings. These notes are best on foolscap sheets of paper, which can be pinned together and taken with you. You will soon be able to judge what is worth an effort to see, and what is not, according to the credit you assign to each artist after seeing a few examples.

The one indispensable book is a guide-book of the latest edition, and the best repute, however dear, as information is money in travelling, and a mistake in making an excursion or choosing a hotel would easily cost double the price of any guide-book, to say nothing of the saving of tips to local touts, rendered unnecessary by good maps. For Italy, Bædeker is best; for Spain, Murray, and for France, Hachette, and I specially recommend the Department Guides of the latter, which are very useful indexes of all that there is of interest, in each town or village of the Department.

Calling on people is not always successful in the way of obtaining positive information on points of detail; "Oh, you know, you just take a bag, and go right south, and come back by degrees," being *one* style of friendly advice. As to going direct south when on a long tour, there is much to be said either way. One reason, against, is that it is not always convenient to start so early in the year, and another is that you are translated into a new style of work which has no direct bearing on your own; whereas, if you go by degrees through France, you pass through districts full of work which resembles, but is better than, what you are doing at home, and naturally you can get to work on it at once. Moreover, when you do arrive south, you will have acquired some skill in drawing, and have learned something of the later results, and meaning, of the earlier work which is met with farther south. It is, of course, a question of season and climate which you must look into. Egypt is visited in the winter, Greece in the early spring, Rome is left after Easter, Florence at the end of July, and so on. Spain can be visited either in autumn or spring, and a winter in Seville may be most agreeable.

As to the countries to visit, Belgium and Germany are good for brickwork and small buildings allied to our own; France should make you logical, Spain critical, and Italy enthusiastic.

Programme is the great feature of French work, the logical following out of certain ideas, excluding others considered as non-essentials. Spanish work invites criticism by the dash with which the work appears to have been done, for form, outline, and programme are less considered, and things are often either masterpieces or absurdities. In Italy you will be roused to enthusiasm, because there you will see good work of all styles, and the early origins of most subsequent developments, as well as the acknowledged masterpieces of all the three arts.

Leaving, however, these generalities of where to go, let us consider what we have to take with us.

The subject of to-night, the "Practical Side of Travelling," can

[1] Extracts from a paper by Mr. A. T. Bolton, read before the Architectural Association, London, May 25, 1894.

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be useful if treated with a detail which has a large element of the ridiculous, but I am not afraid that you will fail to perceive that side of the question. However, to begin with the question of luggage — I never knew any one who took too little, but some who would have been glad to send half theirs home again. The easy manner in which the would-be traveller dismisses the subject previous to departure, is in amusing contrast to his sentiments a few hours past the Channel. I had once to use all my influence to prevent a friend coming out to me in Italy, plus a portmanteau, but he candidly owned, on arrival, that no sooner had he arrived at Calais than he was thankful to have only a Gladstone.

One reason for this luggage question, which it would take too long to examine in detail, is that the heavy luggage is registered, and hence there are nothing like the numbers of porters at the stations that we have. In making a change, or getting into a train, you will probably have to rely upon yourself, and it is of the first importance to be able to carry your goods, yourself, at need. This condition is the determining one in all points of luggage. Registration is fallacious, because, first, it involves arriving early at the station, the process ceasing ten minutes before the train goes; consequently, there is generally a great crowd at the luggage barrier, and it is most annoying to have to be waiting about for your turn, when you want to be securing your place in the train. Secondly, it involves waiting at the other end, as the process of delivering the luggage does not commence till the train is gone, and is often very slow, as in Paris, where, I am told, three-quarters of an hour is a common time to wait. Hence, if you had nothing registered, you would have been off, and arrived in your hotel in the same space of time. Finally, you can only register as far as the ticket goes; luggage above a certain weight has to be paid for, and in some countries no allowance is made at all.

Assuming, then, that nothing larger than a Gladstone is admissible, the next question is number of inches. Here the Indian mail gives a clue. The mail through Italy has a limit of 20 in. by 10 in. by 12 in., and I have had a 24 in. taken to the van. The same 24 in., I may add, I was only too glad to get rid of later on for a 20 in., which I consider the largest size necessary even for a year.

So much for No. 1; next, as we are architects, comes the question, what size board shall we take?

Finally, I decided on a half-imperial, which is really an excellent size. I then had a case made of waterproof-canvas bound with leather, opening the long side, with two straps and two buttons for the flap. This case is best with a flat, light, iron bar along the top to attach the handle to, as, otherwise, you will find that the flap will pull out of shape.

Have this case wide enough to take the half-imperial board (in a 2s. 6d. portfolio with T-square, two set-squares, and 12 in. scale), a stool that will fold up flat, a roll of lining-paper, and an easel.

1st. The board.— This you will find best without ledges, but framed with steel in the thickness, as made by Stanley for abroad.

2d. The portfolio.— This is useful to carry about in the street, as it excites less attention, and also to hold the drawings as you complete them, and the paper you still have to use.

3d. The T-square.— For abroad, the extra cost of mahogany is well worth while. The great problem is the length, and after trying both ways, I advise you to shorten it, so that its total length is that of the board. It is, of course, sometimes a nuisance that it will not reach the edge of the paper, but it is still worse to carry it about projecting in a dangerous manner outside the portfolio. It is also a troublesome thing because of the thickness of the short arm, and I think the best thing to do is to buy one large or two smaller sketching-blocks, which will make up the level over the rest of the board's surface.

4th. The drawing-paper.—Take, say, six sheets imperial (cut in half) of hot-pressed, and the same of 90 lb. cartridge, with some cut-up tracing-paper and a roll of lining-paper; this latter should be the best, for the common tears easily, and the other is only 10d. a roll.

5th. The easel.—This is a matter of opinion, but, personally, I find it very useful. The 3s. 6d. sold at the stores, which folds in a very ingenious way, is a good one to take, and you might have it reconstructed to fold into three, as then you could stand to it at need.

That completes our second package, and is, of course, only necessary if you are going away for three or four months. If for less time, the third that I am about to describe will be sufficient. This is a bag or case of canvas, in two thicknesses, and water-proof, made by Pontifex & Wood (next to Victoria Station), for 18s. 6d. It has two divisions, one of which will take a quarter-imperial board and a portfolio, as before described, while the other will contain your things for a stay of one or two nights. It has, as before, two straps with a handle and buttoned flap; and also loops, in case you prefer to carry it as a knapsack. It should contain: 1st. A water-color case, holding a short box of twelve paints, a small water-bottle, and a pocket for tubes of color; 2d. A 33-foot tape, and a small ball of twine with a lead plummet for measuring greater heights; 3d. A short spirit-level, most useful in getting certain heights, as of bases, etc.; 4th. A pair of callipers of wood, opening to 2 feet, useful to take the diameter of shafts and other things otherwise very troublesome to measure; 5th. A pocket-case of instruments; 6th. A box of twelve pencils, B. S. Cohen F being the best for all-round purposes. So much for the architecture. Then a hand-size hair-brush, short combs, razors, strop, soap in case, short clothes-brush, small box of matches, and flannel night-gown. You will also find that you can get two white shirts, collars, and a pair of socks in the other division on occasion.

Now the reason why you will want a quarter-imperial board as well as a half, is that the half is mostly for use at the hotel for drawing out what you have measured, and, secondly, that there are many short excursions, of one to two nights, to be made from a central point where you would leave your other two packages. Consequently, I consider this No. 3 as indispensable in any trip, short or long.

Now for the fourth package: This is a rug, coat, umbrella and two measuring-rods in a case, made up into a roll with rug straps.

The author then went into various suggestions as to clothes to be taken, etc., concluding with the recommendation: In luggage the thing to aim at is to have only the absolutely necessary, and what occupies space are generally things which, if we exercised a stricter supervision, we should leave behind. After a time you will know exactly what you want, and will be able to get ready for a journey at a few hours' notice, and yet go away without leaving the indispensable behind.

After luggage, the question of money is of the first importance. It may govern your route to an extent that will surprise you, and your stay at any place may be either cut short or made unduly long by the difficulties of obtaining supplies. Having tried several plans, I consider, on the whole, that Cook's or Gaze's *5l.* or *10l.* forms are better than letters of credit on a private bank, simply because their list of agents is more complete, and contains the places you most want to visit, whereas the agents of the private banks are mostly at modern centres of commerce, which are not what you travel to see.

At your bank you will be told, probably with a patronizing smile at your ignorance, that their credit-notes can be changed anywhere, a pious delusion which one wishes they might have to experience for themselves. Not only will you experience a most distrustful reception in tendering such paper at other than the accredited agent, but the branch office even of a credit society, many of whose other offices are given in your letter of indication, will decline to pay unless the name of the town where their particular office is situated is given in the list. This sounds incredible, but has happened to me more than once. Consequently, study your letter of indication, and note the towns having agents, which you will pass, and arrange to take in your supplies at intervals.

Moreover, in France, and still more in Spain, out of the larger towns, and sometimes even there, the banks are very shy, and raise great difficulties if your papers are not exactly correct. Consequently, it is a very good plan to go to the bank soon after arriving, so as to secure that you will be able to command your money; and if there should be any difficulty you will have time to write to a head office or to London in order to overcome it.

Remember that you will be absolutely helpless if you have no money abroad; the smiling countenance of your *maître d'hôtel* will become black as night, and everywhere you will find yourself suspected. Happy, indeed, you will be if you find some countryman who will risk a loan to carry you to some other town. And so, if you meet any other Englishman in such a plight, endeavor to assist him, as you hope to be assisted some other day.

If you decide on private-bank letters of credit, observe whether they are payable at sight or not, because I have had some at seven days' notice, which made a local office propose that I should wait twelve days before I received the money, being the time to write to Paris, seven days' delay, and time to write back. A very cheerful prospect if you should be in an uninteresting place!

Remember that you will probably stay longest in small places, where English notes are almost unknown, and the plan of carrying five-pound notes, which may answer in Italy in such towns as Pisa, Genoa, etc., will be disastrous elsewhere. A good hint I can give you is to carry a few sovereigns in a watch purse as a reserve, as, at a sacrifice, you will, I think, be able to change them anywhere.

Well, then, having your letters of credit all right, and having found the agency, you are in presence of a difficulty, and that is to obtain the full value of your money. Your paper states that you are to be paid in the local currency to the full value without deduction. Moreover, as you have paid in gold, and the notes are payable in gold at London, there is a profit to be made on the exchange, and you are entitled to the market quotation of the day. Consequently, in France, you ought to receive 25 francs to the pound, plus a premium of *3d.* or *4d.*, according to the market, but which generally amounts to *2s. 6d.* on *10l.* Now, as the agents can always wait a rise, there need be no scruple on your part in exacting the full value of the day on the plea that they are entitled to something, as you may be certain they will not lose; in fact, I doubt if you will ever get your due. I can, I regret to say, only recall one agency where I have received the full, without asking, even in the most reputable houses, though I can remember many battles on the subject. In fact, I confess I have got tired of fighting, and have now and again submitted to the loss, and even to an absurd deduction for receipt stamps.

But as many of you are men of war, you will do a good service to the weaker brethren by insisting on your rights, and may also flatter yourselves that you are asserting the superiority of English currency.

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Of course, in Italy, Spain and countries with bad finances, you will get very much more than 25 francs to the 1*l*. As I said before, it depends on the market.

Now, before you start, change at Charing-cross, say, 1*l*., so as to be able, during the journey, to pay goods, porters, etc., in local value, as they will only accept English silver at a loss; and do not, by the way, take English 2½*d*. stamps with you to send home your letters with, as sometimes happens. In Italy and Spain at present there is practically no gold in circulation, but as the paper notes have a forced currency, that will not matter. You must take your chance as to these notes, since you can hardly hope to know good from bad without much practice.

With regard to the amount you must take, the expense of travelling is no doubt always increasing, and in estimating, regard must be paid to the length of your tour and the plan you have in view. Sight-seeing travel is the expensive method, and the farther East you go the more it is so. France is dearer than Italy, which is the cheapest country I have been in. A short tour is also much more expensive relatively, because the initial price of the ticket unduly raises the average daily price. You ought, especially on a first tour, to keep exact accounts and to average your expenditure from time to time, because you thus learn what constitutes the chief expense in travelling, and how you can best reduce the average. It is very difficult to compare the relative expenditure of students, because everything depends on the style. You can spend any sum, as some Americans who get through extraordinary amounts for what they do and see.

Long stays have an important influence on the average, because such items as hotel tips, porters, 'buses, sacristans, etc., which bring up the average enormously, when moving about rapidly, become relatively unimportant, and of course you can make better terms at the hotel.

Well, subject to these considerations, here are some figures of probable cost: nine months, extending as far as Athens, 150*l*.; six months France and Italy, 100*l*.–110*l*.; three months, 60*l*.–70*l*.; two months, 40*l*.–45*l*.; a month, 25*l*.–30*l*.; three weeks, 20*l*.–25*l*., etc. All these assuming you go some distance away from home.

These figures involve comfortable travelling, second class on through journeys, good and fair hotels, photos and occasional excursions, a drive now and again, newspapers, cafés, etc., but mean that you must know something of the language for the longer tours, and that you must make some stays of three weeks to a month in smaller places, where you can live for 5s. a day. Of course, you will be told of record cheap tours, but remember this, you go to work, and work on bad food in badly-drained hotels may mean fever, which is decidedly not economical. I have read accounts of tours where from the remarks made about weather, people, etc., I have been certain that the writer was suffering from over-cheap travelling. Again it is a mistake to sacrifice your pleasure to unreasonable economy — I mean by omitting an occasional excursion or other semi-amusement on the score of expenditure, because you will find, in your subsequent recollection, such outings form the most pleasant features of the trip. But if you do make such excursions, see that you have the means to do the thing properly. One sometimes sees people abroad do such things in a shabby way, instead of omitting them altogether.

Start your tour with extreme care in your accounts and expenses, as, until you have gained experience, you will waste a great deal of money, and will thus load your average unduly, and it will take much economy to counterbalance it.

A good plan is to make up your accounts on leaving a place, including the ticket to the next place, and the hotel bill, tips, etc., just paid. Reckon up your balance in the train, and note the amount and hour; then, by deducting from the similar statement on the last departure, you can reckon the number of days and the amount spent, which will give you your average.

Mr. Anstey, in *Punch*, under the title of "Travelling Companions," has given a good guide to this subject to those who can see the moral. I have only to add that, in my opinion, Scott's advice never to go with laymen, if you want to work, is sound, for, as he says, when they have finished a place you want to begin.

I think, too, that some similarity of age is advisable as well as previous acquaintance, because we all go through certain stages of beliefs, and you will, in the abundance of your time for talking, infallibly discuss, not so much what you are seeing, as general theories of art, and to have to refute your cast-off enthusiasms in the person of a younger companion may be salutary, but is somewhat wearying.

Bear in mind what the Master of Ballantrae said to Captain Bourke when setting out on their memorable journey, "Either let us agree to bear all things at each other's hands, or else let us part at once." As to travelling alone, no doubt it procures unanimity, but I question if it is not better to bear all things rather than to be too much alone. The great advantage from the point of view of an artist, is that concentration of mind essential to the receipt of impressions, when sight-seeing; and, in working, you have the advantage of being free to undertake things that require time, knowing that you can go, or stay, as you please. France, from the generally genial character of the people, and Italy, on account of the greater number of tourists to be met with, are the best countries to travel alone in, but do not do so in Spain, on account of the long uninteresting journeys that have to be made from town to town, and the not very sociable character of the people, for a really good knowledge of Spanish is required by those who would mix with them. Travelling with another is a drawback to learning the language, without question, and, to some extent, it prevents your seeing so much of the country and people; but, on the other hand, if you have a friend to go with, excursions on foot, or otherwise, which you would not make by yourself, are more feasible, and this especially is the case in those which are made for the sake of the scenery, when absence of work to do might make the solitude too much felt.

It is hazardous to rely on finding some one abroad, as you will generally find the parties already made up, and fellow students are not often met with except in certain of the larger centres. It is an interesting chance if you should be able to travel with a foreigner, especially of your own age, and leads to a rapid progress in French, which is probably what he will speak.

[The author's remarks as to hotels and living abroad we must omit, as they have no special reference to architectural travel, and we cannot afford space for them here; and must proceed to the portion of the paper which has special bearing on the work of the architectural tourist.]

Concierges and sacristans should not be ignored, and according to the country should be their treatment. In France they are very powerful and often troublesome; in Italy and Spain remember the attempts to postpone your visit to their customary "to-morrow," may be met by saying that you are leaving to-morrow or to-day, as the case may be, when the loss of the prospective tip may be found to be effectual in removing difficulties. In Italy the direct negative is generally to be met by persistence, as it is often due to the desire to avoid trouble, while a courteous and hesitating negative is likely to be final, as it is generally a polite preface to a refusal. There is always something of the actor about the Italian, as you remember that the Pope, when being stormed at by Napoleon, the Great, was heard to mutter "Comedian!" and a desire to avoid giving offence is often an explanation of the small comedies which they may put upon you. Once in a museum, I was going round with two Italian students and the assistant curator, and, being desirous to examine an object in a case, asked to have it opened. The assistant was most polite, he thought it was not possible, but would go and inquire of the chief. On his return, one of the students asked, as I was not supposed to know Italian, "Why did you go? Would the case have been opened?" to which the assistant frankly replied, "Oh, no, but he is a foreigner."

It is a good plan not to alarm a sacristan or concierge by going with a big board and apparatus, as if you were going to be a long time at work, but rather to begin quietly at first, until they have got used to you. The thing is simple enough — no average man wants to do more work than he need, or to be put to much trouble, and the aim of the average sacristan is to run through as many visitors, and to receive as many tips as possible during his working hours, and hence popular show-places are the worst to work in, the artist, and especially the architect, being a troublesome intruder.

I think you will do well to ascertain the hours of the attendants and to conform to them as much as possible, and when going round in a party in the regular official circuit of a show building, you should, I think, in politeness, keep with the party, and on its completion ask for permission to make further study. In this way you may obtain, as a favor, what would only be obtained, by force, with much loss of time and temper.

Introductions to architects and others abroad are very pretty things, and sometimes interesting information is obtained from the people called upon, but remember, first, you may have no end of trouble in finding the addresses in a strange place; secondly, in calling the best hours of the day will have to be employed, and, thirdly, the interviews themselves may take up a disproportionate amount of time. They should not be used by those who are not at home in the language of the country, and it is no easy matter to converse on all the subjects that will be raised, for it is extraordinary how other topics will creep in, especially in the south, and to listen to their views on English policy will be calculated to reduce you to despair.

The Royal Institute of British Architects' travelling card, the Academy bone, and, lastly, the Architectural Association membership ticket, will be found of service as credentials when applying for leave to draw and as proofs of your profession; The Royal Institute of British Architects' card, however, is not well got up; it compares most unfavorably, for impressiveness, with the 3s. 6d. Government passport which anyone can get. Moreover, the face should be in the language of the country, and not the back, as suspicion is caused by the request to read the back, and the presence of other languages there also is not favorably regarded. An adapted copy of the Government passport, and one for each country, would be the best thing to give students. The letter given to prize students is, however, favorably received, as, though it is only in English, it is big, and looks official. With it you are taken for a student sent by the Government, for the English private enterprise is not understood in countries where the State does most things.

Permessi are a modern invention, a plague of officialism on the field of art, and an ill-considered method of compensating, by State action, for the personal care of the owners, now dispossessed, of their churches. The most justifiable and useful *permesso* is the free pass at Pompeii, given at the Naples Museum to all who are students, and which frees you from guides and the entrance-fees, rightly

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enforced on tourists. Next comes the one to be obtained at Florence, which also gives you the right of a free entry to certain museums and old buildings, but which, like many others, does not confer that freedom of action as to measuring, and architects' work which can best be obtained, as a rule, where the priests and monks still are in possession.

At Rome there are no less than three authorities: first the Royal Government, in the Via Ripetta, to obtain a *permesso* from whom a letter from your Consul is necessary, stating that you are an artist, the Royal Institute of British Architects' card not being considered sufficient; secondly, the municipal authority, who have control of the Capitol Museum, containing some fragments of architectural detail; and, lastly, the Papal authority, for the Vatican Palace and Museum, who must be applied to a few days in advance, and whose form does not include leave to measure. The Vatican is the most expensive building in the world, I fancy, to see over, as at each door a guardian expects something. Go, therefore, provided with plenty of copper. It is also of little use to apply to see parts, of interest to an architect which are not shown to the public, unless you can command influence with the authorities.

In other places, as a rule, do not apply at all for permission, as it wastes so much time. I made five to seven fruitless calls on an architect — I believe connected with our Institute — and eventually failed to obtain permission to examine, from a scaffold, some work in which I was specially interested. In churches and convents, observance of the hours of openings and shutting, and taking care not to be in the way of services, will generally suffice to prevent your being interfered with, and will, where there are no officials in charge, as a rule, suffice, as the priests and monks are generally well disposed to artists, and they will often lend assistance in a way that no official would dream of doing. The worst places are show churches in big centres, for the sacristan's whole ambition is to pass through as many persons, representing tips, as possible, and an artist who hangs about, and pays little, is regarded as a nuisance. In Rome you may have to resent their action, and the best answer as to what you are doing is to say, "Is not the church open free to all?"

As to working in churches, you need not be afraid to work if a service is going on, provided you are not in the way, or in too conspicuous a position, and provided also that during Mass, or Benediction, you pay some attention to the bells, so as to cease from working at moments when reverence is required. If, however, it is a feast day, or the church is a specially fervent one, this will not apply, and you will, of course, stop at once on being asked to do so, which will create a good impression and facilitate your work another day. Continental ideas of the use of a church are, as you will soon find out, different from our own; there is more of the public place, museum, and temple, than of the meeting-place, to be occupied only for so many hours a day or week; very likely you will prefer your own ideas, but need not any the less observe these while there.

I cannot see that difference of opinions can be justifiably translated into outward conduct in foreign churches, especially at service time, and nothing more is expected of any one than an inoffensive neutrality of attitude, especially necessary when the chief places are taken by our ardent sightseers, intent on putting through a function.

If a cantankerous sacristan should refuse permission to draw and refer you to authorities, it is not always well to hunt them up, because of the loss of time, difficulty of finding them, of making yourself understood, and of working in face of opposition when leave has been obtained.

If the sacristan cannot be overcome by persuasion, or a bribe, it may be wisest to go on to another place. In Spain, however, the priests seem to have a greater control over their officials, and I have found them most favorably disposed to students, regarding leave to draw as a matter of course, which is our view of the question. I often pity the poor foreign student who comes, if he ever does, to England to work, where the making of drawings seems to be considered as a deduction from the value of the property, and a consequent offence, and where many parsons expect to be humbly sued by the poor artist for leave to ply his trade.

As to the sight-seeing of show places, it is of course absurd to spend time in seeing what you do not like, but until you have seen it you cannot know what it is like, excepting by analogy, *i. e.*, from having seen similar places, and then you will be very likely less inclined to omit the regulation visit, perceiving that there is some advantage in having seen what the average man sees, and what he will talk about, if the subject should be discussed.

It is a saying of Goethe's that you will only find in Rome what you take there. Many places owe their attraction to associations, historical and literary, and the charm is absent unless one has some previous acquaintance with him. On the other hand, seeing such places is a powerful motive to reading, giving some actuality to the dry pages of history.

Advising students what to see is risky, because they may miss the point of interest for which the particular building is valuable, and may then fall foul of your judgment, as in the case of old buildings, now encased in bad detail, which are only to be realized by the skilled observer.

As to the time to spend in travelling, there are two plans — the rush round, and the long tour — which both have their uses, and are better not mixed. A rush round should be short, say three weeks, and should cover all the important places in the country, so as to gather a general impression of its art, and an idea of what class of work you will take up when you come back again, and it is better to attempt no work at all.

I am all in favor of the long tour; the rush round I regard as a useful preliminary, and certainly better than none at all; but a country cannot be studied, as it is, without a residence of some length, and without the exploration of its smaller towns. A brief tour gives one a better knowledge, in one's own opinion, of the country than a longer one, when one will feel that one knows nothing, so many are the aspects, and causes, that can be dimly seen, beneath the surface.

When I made my first rush round Italy it was spring time. Florence was all wind, and Venice all rain. The lilac only was out, and fields were bare. Where, I wondered at the conclusion, was the Italy of poet, and of painter; and I resolved the next time I would go through the summer and autumn in the country. This I regard of great importance. A hot country must be seen in the hot season to understand it, and to appreciate it at other seasons also. Heat can always be supported by observing the customs of the people, which are the results of centuries of experience.

From an architectural point-of-view the long tour is even more desirable, because the important things can be undertaken, which would not be worth doing in a hurry, and in our work the details have often a great influence on the scheme. Moreover, towns and villages that are not worth visiting, in a rapid review, are worth seeing when time is less ot an object, and then we can see what a style means in its smallest work, and often how it originated.

Previous to over-running a town consider its history, for towns grow like trees, in successive layers, and street improvements are not a modern invention; thus at Rome, the work of Julius, along the Tiber, contains interesting work of the architects of his age, no other than Raphael and Bramante. Avoid suburbs and outskirts of towns, except where you have reason to expect that churches, once in the fields, have been engulfed in them. Sight-seeing is fatiguing, and over-walking should be avoided. The long streets of Paris are a great snare to enthusiasts who fail to realize the distances.

On a long tour, when visiting a town, it is best to devote the first day to going round, and it is a good plan to do this with your companion, as there is economy in sharing the fees, and it is generally advisable to make the regulation visit round the chief buildings, and often to ascend the towers, or to the roofs, both for the sake of the curiosities of their construction, and to get an idea of the city as a whole. When doing this first day's visit you should note down what appeals to you most, forming a programme of work, which you may, or may not, be able to complete, before you have to go on. You can also, thus best arrange with your friend, as to the duration of your stay, by each alternately making concessions.

Sight-seeing is education, but not study; sketching is practice in perspective; it is in measuring up that the special work of an architect consists.

That would seem to be most useful, as study, that most closely resembles your daily work; work therefore on your usual papers, with usual pens, pencils and colors. One would say that you will best provide against disappointment if you represent your new work in a similar style, to that in which you have drawn the old. And it has often been said before that, while a painter's picture is his finished result, that of the architect is only a means to an end, the building being the product by which he is judged. I confess to a fancy, however, that there is a value in a rough style of drawing, for effects, which would shock the conservative, assuming that it is merely supplementary to sound elevation, plan and sectional drawings. In the result, much of architecture is due to the sun, and the value of a photograph is often that of its light and shade. I do not desire, however, to enlarge on this topic, for precept is one thing, and what is successful is another, and I could only expect you not to blame me, in the result, if you had been following your own bent, which is the best advice that any one could give — the pursuit of a method to its logical end is the truth, or reason, of many men's achievements.

Sketching is supposed to be a matter of instinct; hints are generally more wanted as to materials than as to methods; in measuring, however, there are certain difficulties which one may fairly expect to have explained. There are practically two ways of drawing buildings to scale, the first the old "measured sketch," which is a ruled elevation to scale, set up from measurement of the lower, accessible, portion of the building, what is not to be got at being put in by proportion to what is known. The other method, the measured work proper, is drawn out, not necessarily on the building, from sketches of every feature with its measurements attached, the drawings being, as it were, built up from the various details of the building. The best way to go about the latter method is to rule a diagram of the front on a block of, say one-fourth imperial size, on which your main dimensions will be put, and then to sketch all the various features on sheets of the same size, so that you can keep them all pinned together, for reference. Good measuring could be drawn out by any one, a standard of perfection I do not claim to have reached myself. The great difficulty is to get the key dimensions without unnecessary measurements, which serve only to obscure and confuse your work. As to ladders and scaffolding, they cannot generally be obtained, and ingenuity has to supply their place.

Much can be done by measuring from above, from the parapet or cornices, from one level to another, and from window to window sideways, and up and down from a window to strings, and so down

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to the ground. In one drawing exhibited, the problem was to obtain the total height of a building, which was a mere shell without any upper floors, the façade being a smooth stone wall, the top of which was inaccessible. Eventually it was done by slinging a plummet, at the end of a string, right over the top, and drawing up the tape, then attached to it, until it touched the underside of the top fillet of the cornice. The total height was thus obtained, as well as the projection of the cornice, the height to its underside being ascertained by means of an unfinished cross-wall, the top of which was nearly level with some circular attic windows. To get on to this cross-wall only a rustic ladder of insignificant height was available, but there happened to be a fireplace in the wall, and as the ladder could be safely placed upright in the recess, and as it is easy to pull yourself up out of a hole, if you can get a hand on its rim, the flue proved a possible method of ascent. Thus the attic windows were measured, the height of architrave and frieze, and various other details obtained. Spires and tall roofs can be obtained by some methods given in the "*Architectural Drawing-book*," but the best way is to climb up inside, as there are generally pieces of wood, nailed onto the central posts, in the case of timber-work.

I admire, myself, those who do not omit the difficult and tedious work of projecting the corbels of a cornice on a circular part, or the correct setting up of tracery, or those other points of drawing which appeal only to the skilled observer. Arches and vaulting are also not so difficult to measure as they appear, and you should copy out of Spiers's work the methods of doing them, to take with you until you are efficient in them.

It appears to me that there are things which are worth measuring in a diagram style, for the sake of the proportion and outline, rather than the detail; and, in these cases, it is surprising how quickly, by practice, such examples can be measured, so as to be drawn to one-thirty-second, or one-sixteenth scales. You will need only the key dimensions, one pillar, or pier, for the plan, and the general heights only, for the section or elevation, and can put in the detail of the style as you like; but such work should, of course, be distinguished as a measured sketch. Measured work is so laborious that it is not surprising that cheaper methods are common, but the putting of dimensions onto a sketch is not, to my mind, of the value usually ascribed to it; the proportions are not to be obtained thus, and, as a rule, such dimensions are inadequate, if you try to draw out the work; while the possession of old work, to the scales you are accustomed to, is of great value. What architects differ most in, is the number of features that can be crammed into a façade of a given length, and how can scale be learned save by experience of old work?

In conclusion, the advantages of travel are questioned mostly by those who have not been abroad, and a chance of going modifies much our views of the subject. Any one will admit, of course, that why the advantage is often little, or none, is due to the spirit in which it is undertaken. No one can be taught against his will, and an atmosphere of prejudice will prevent any man learning the most obvious facts. The value of going more than once lies in the fact, that the first impressions are most distracting, and I think that a rush round, which gives some general idea of what there is, has a great value, as a prelude to a second, more serious, working tour. And I think this first rush round of the beginner should be taken much earlier, in the pupil stage, or, better still, before, as nothing should so open the eyes of the beginner as to what architecture means, as a sight of the grand buildings of the past; moreover, time is not lost in this, wearing off of the novelty of fresh impressions, as on a second tour work can be better done, the mind being less distracted.

From other points-of-view, it must be remembered that we live on an island, and, by imports, in art as well as in food, and this importation has been continuous, hence old work, no less than modern, is best understood when foreign originals have been seen. Canterbury choir is not less liked when you have been at Sens, nor the Reform Club when you have seen the Farnese, and only the other day I was interested in seeing Spanish features, in St. Mary's and the Cathedral, at Bristol. Architecture is wider than nationality, which shows itself mainly in the class of building chiefly required, being better treated in one country than another, and in a certain general stamp of the characteristic of each race, such as refinement, grandeur, vigor, etc., in less or greater quantities.

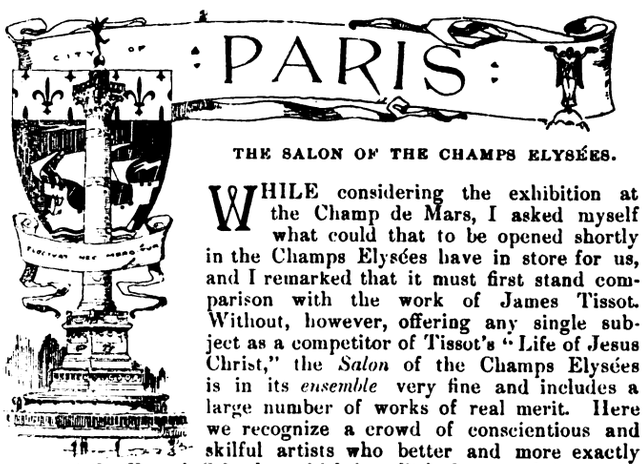
The greatest abuse of travel is heedless importation of features that have no previous root over here, instead of learning how to modify the old for the work of the present; imported work usually dies out, however fashionable it may be for a time, and a design should not require to be understood by the light of what has been done exclusively elsewhere.

That there is nothing more to learn, owing to the numbers who have been there before you, is a pure delusion. It is extraordinary how the obvious is overlooked. Hundreds had seen the Town Hall at Piacenza, but when brickwork was built on granite, with no division between, it was justly regarded as a novelty; and, as Bacon says somewhere, chance is more responsible than pursuit for most of our discoveries, what is known being but a particle of what is passed over.

The importance of travelling may easily be exaggerated, but as now-a-days the world in general travels, the architect should at least have seen the more important monuments, as his client will very likely have had that advantage.

From the point-of-view of examinations, I would prefer to spend the fees of all the courses in seeing, rather than hearing about, the buildings, and architecture, in question. If you have been at Vicenza, Palladio will never stump you, and Scamozzi, Ictinus, and others, when you have seen their works, will be no burden on your memory.

The greatest, however, of all the advantages of travel is the acquirement of freedom. Every generation has, in art, as in other matters, its own cant ideas, and phrases. Travel is emancipation, in that art is wider than convention, and a knowlege of all the styles of the past is the best protection against the formulas of the day. When told of such and such mysterious qualities to aim at, and this or that method of doing it, you can reply effectually by quoting some leading building, treated on the reverse method; and if that be excluded, there will always be another, for art is wide, and principles are hard to stretch; as it has been said, the subtilety of nature is beyond understanding, so that the theories of mankind are a kind of insanity, only there is no one to stand by and observe it.



THE SALON OF THE CHAMPS ELYSÉES.

WHILE considering the exhibition at the Champ de Mars, I asked myself what could that to be opened shortly in the Champs Elysées have in store for us, and I remarked that it must first stand comparison with the work of James Tissot. Without, however, offering any single subject as a competitor of Tissot's "Life of Jesus Christ," the *Salon* of the Champs Elysées is in its *ensemble* very fine and includes a large number of works of real merit. Here we recognize a crowd of conscientious and skilful artists who better and more exactly represent the French School — which is a little lost to sight at the Champ de Mars, in the midst of new and revolutionary manifestations of art. It must be confessed that after the attempts and experiments lately referred to, one feels less troubled, less disquieted, before these paintings so solidly studied, in which neither a feeling for nature nor knowledge of drawing is wanting, and which are the outcome of persistent and serious labor. But it must not be inferred from this, that the exhibition here is monotonous. Quite the contrary, we find here, on attentive examination, a great diversity of talent. At the Champ de Mars, also, were to be discovered interesting attempts which diverged widely from the commonplace and amongst other things the work of M. Rochegrosse might be signalized.

But how many pictures! What a multitude of frames! The tide of painters swells unchecked and one may not know where it will stop. Exhibitions are held everywhere! To whom are all these things sold? Since amateurs nowadays make their own paintings, where do all those made by professional artists go? Would you know the exact number of the paintings that the critic who wishes to slight no one must inspect? The following tabulation will show how many there are and suggest how much time would be consumed in examining all:

	Champs Elysées.	Champ de Mars.
Paintings	1,887	1,201
Pastels, drawings, etc	805	487
Sculpture	1,071	135
Architecture	208	39
Objets d'Art	66	253
Engravings and lithographs	522	134
	4,559	2,249

That is, at both exhibitions, 6,808 subjects are shown, and of these 3,088 are paintings, and half as many more have been rejected. This is setting up a color-shop with a vengeance! In 1889, before the schism, the *Salon* of the Champ Elysées hung over 2,771 and this number was unusually large because of the Exposition of that year. Still, since things are so, one must take courage and advance boldly in search of interesting paintings, and we shall find altogether too many of them to mention all in such a brief review as this.

But each year there are certain works which assert themselves especially and which give a date to the exhibition in which they are included. In the field of decorative painting, M. Bonnat gives cause for much talk in the circular ceiling decoration intended for the Hôtel de Ville. Ah! this poor Hôtel de Ville! what a meagre idea it will convey of our taste in decorative art in all that concerns *ensemble* and harmony! The necessity of placating all sorts and kinds of artists has brought together a pell-mell of all kinds of work. A hall is not entrusted to a single artist; it is delivered into the hands of several who make of it, not a matter of decoration, but an exhibition of paintings, which is an altogether different thing. Is Bonnat's work to be the neighbor of Puvis de Chavannes's? Let us

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hope that it is not. Just as the latter's work, in spite of all reservation, is conceived in a decorative vein, so far as line and tone go, so that of M. Bonnat is violent, clamorous and harsh. The "Triumph of Art" is represented by a genius, torch in hand, mounted upon Pegasus, who, bounding into the air, overthrows in his spring the demons of Envy and Ignorance. This very energetic painting lays stress on academic and anatomically correct nudity, but the *ensemble* is lacking in unity; the clouds modelled with coarse brown strokes make extremely harsh darks against the silhouette of the white horse. It is to be feared that the horse will make but a flat and unmodelled spot; moreover, the deep blue of the sky seems rather brutal. Why is it that all painters fancy that they are decorators? Decorators are not made in a day; their work requires preparatory study.

The great painting intended for the Council-room of the Hôtel de la Préfecture at Lyons is rather more decorative, although even this is treated too much as a mere painting. The author, Mr. Edouard Fournier, has here grouped under a colonnade, overlooking the valley of the Rhone which stretches out fair and hazy into the distance, all the illustrious personages who have been born at Lyons, ranging from Claudius and Germanicus down to Puvis de Chavannes, Claudius being seated by the side of Germanicus, on an antique exedra in the centre. Around these are grouped the elder worthies of the town, their light-colored robes yielding luminous tones in opposition with the illustrious men of modern times who are seated on chairs, of modern make, in the foreground. Right and left in the second plane are to be seen the sculptors Coustou and Coysevox, the architect, Philibert Delorme, as well as Mlle. Lespinasse, Mme. Récamier, Flandrin, Jussieu, Ampère, Jacquart, Chenavard, Soulary, Laprade, Jules Favre, Meissonier and Puvis de Chavannes, who, as he is still alive, can find himself here restored to youth.

Decorative painting has also been attempted by M. Debat-Ponsan, who has been entrusted with composing a ceiling for the Hôtel de Ville, at Toulouse. Here the City of Toulouse, in the guise of a pretty woman seated upon a cloud, receives the crown presented to her by Painting, in the form of an undraped figure, about whom flit four other figures which represent the different arts. It is a commonplace yet agreeable decoration, but is skilfully handled.

The "Apotheosis of Gutenberg,"— yet another ceiling decoration — by M. Quinsac, is also an agreeable composition, for the artist has paid a little more attention to his perspective effects than is usual with artists in these days. Gutenberg, too, is receiving his crown, as he sits upon a circular bench on the landing of a flight of stone steps. Upon the steps at his feet are naked infants — who have clearly been taught to read at a very early age — poring over books. In the sky above are to be discerned draped figures, amongst them Fame with her inseparable trumpet.

Not far from this ceiling-piece, the painting of M. Rochegrosse attracts attention because of its subject and the way in which he has handled it. The subject is poetic, ideal, immaterial, and consequently abounds in pitfalls when it comes to translating it into painting. Its title is "Le Chevalier aux Fleurs," and a placard explains that the elect, clad in symbolic silver armor advances, careless of the allurements of life, toward the Idea. These allurements are represented by seductively attractive young girls whose sole bit of raiment is the flower which each symbolizes, and this is worn upon the head. They emerge smiling and enticing from amongst the flowers, through which the knight is passing, their brightness reflected in his armor. The composition is brilliant and sunny, and the effect of these blonde undraped figures is charming, but it is singular that the shadows cast upon the flesh tones by these variously-colored flowers is uniformly violet.

M. Nicolas Escalier is an architect, but he is also a painter, so that it is possible for him to carry out with his own hands the decorative portions of his own conceptions, and this is not what most of us can do. His panel entitled "Gallantry" is charming, showing, as it does, a last century couple exchanging tender nothings, while leaning over a balustrade at Versailles. It has elegance and style, as might be expected from the author's general qualities.

M. Le Liepvre has made a specialty of decorative landscape treated in broad masses, in which the feeling for nature is allied to that for decoration. With him let us stop the list of decorative paintings at this exhibition.

Of portraits it is always difficult to speak, except by giving a list of the artists or their sitters, where noteworthy. M. Chartran's portrait of President Carnot must be mentioned, although it is not so fine as the artist's portrait of Leo XIII, exhibited two years ago.

The fashion of the moment which has brought about in literature and on the stage a revival of Napoleoniana, should exercise the same sort of influence over painting, and so we find no less than twenty-one Empire episodes here represented. One of the most noteworthy is the one which has been worked out by M. Jean Paul Laurens, representing the interview between the Pope and the Emperor, the day when the latter proposes the signing of the concordat. The Pope, Pius VII., clad in white, with fur-trimmed purple cape, is seated brooding in his chair. He has just murmured the word "Comedian!" but loud enough for the Emperor to catch it, who has bounded from his own chair at the insult. Comedian! He! There he stands with folded arms in front of his overturned chair braving the Pope, and it must be granted that his attitude is in keeping with the Pope's epithet. Unconsciously, one thinks of the actor who at the moment is impersonating Napoleon at the Vaudeville, in Victorien Sardou's play, "Madame Sans-Gêne." But with this episode for a subject, how could the artist avoid being theatrical. However this may be, the painting has attracted much attention, since the work of such an artist is rarely uninteresting, and the ability of this one to excite emotions through a simple bit of detail is well known. Here, though the attitude of the two personages is immobile, yet the painting suggests violent action through the presence of the overthrown chair and chapeau. The elaboration with which the pattern of the carpet is worked up is disagreeable to the eye.

M. Lecomte-du-Nouy also exhibits a Napoleon, or rather a Bonaparte. The scene is laid at Beaucaire, where a group of men are supping at a table in front of an inn, to whom a young artillery officer, standing before them, declares, that there will appear a man, who will succeed in uniting on himself the hopes of the whole nation. Another Napoleonic picture is that of M. Kratké, where the Emperor is shown with folded arms, standing in deep thought before a peasant's fireplace. The scene is laid during the campaign of 1814, and through the window can be seen passing in the snow, the old grenadier guards. There is not much sentiment in this picture, and what there is, is merely that which the observer chooses to add to it. Very different in this respect is the picture of M. Boutigny, which has been suggested by the memoirs of Marbot, and represents the Emperor kneeling at the foot of the stretcher, on which lies Marshal Lannes, just after his leg has been amputated at the battle of Essling. The scene has been admirably depicted, and the artist has known how to charge with emotion the countenance of the weeping Emperor, as he clasps the hand of his faithful follower. The scene is full of human and acute feeling, for Lannes lies in a court-yard, around which lie wounded soldiers, all observing the scene with curious interest. It is, however, rather remarkable, that after so severe an operation, there should be so little blood upon the ground, or on the white breeches of the sufferer, but this is in keeping with the well-brushed aspect of all the uniforms.

Without the help of Napoleon, M. Beauquésne has produced a good military picture; of small size, to be sure, but full of movement — an episode of the war of 1870: The retreat of a field-battery down a street in Bapaume is being covered by the 7th Hussars, who charging down the full width of the road leave behind them just space enough for the fleeing battery to wheel and turn. The effect of this contrary movement is excellently rendered.

In consideration of the enthusiasm caused by the visit of the Russian Squadron with the attendant *fêtes*, it was to be expected that there would be at the *Salon* several Landings at Toulon. One of the most important of these is the large one by M. Chigot, who shows the entrance of the barge of Admiral Avellan into the Arsenal of Toulon, the admiral standing in the stern-sheets and acknowledging the enthusiasm of the spectators and the salute of the cannon.

Perhaps I ought to have begun by speaking of one of the most important pictures of all, that by M. Detaille, "The Victims of Duty." Neglecting the military proper this year, the artist shows us those who have to fight a terrible adversary every day — fire. A fire has broken out in a narrow street and the street-crossing in the foreground is full of apparatus and firemen — the fire-engines are busy, the flames being reflected from the polished work about them. The authorities of the town, too, are on the spot attended by the *sergeants de ville*, forming a group who have removed their hats out of respect to two victims of duty who are being carried away in the arms of their comrades. The fire is behind the building at the left, and its flames light up the scene with a sinister glow. The painting, life-size, causes poignant emotion in the beholders. Some blame M. Detaille for a too strict adherence to the munitiæ of naturalism and say that the painting suggests a "*proces verbal*," but, even then, to produce such a work, extraordinary knowledge, conscientiousness and ability are needed. M. Detaille handles his figures like Meissonier, but he gives them stature and works more broadly. The painting is doubly a success, being both popular and artistic.

M. Roybet renews his success of last year, with his painting "La Main chaude." It has the same spirit, the same rather vulgar and loud air of gayety. A stout tavern maid, the same who last year was being teased by a soldier, is here, somewhat dishevelled, playing hot cockles with some other girls and a few loungers. There is plenty of kissing, laughter and noise, but there is the greatest simplicity in all the hullaboo and all the participants are in such good health and so well content with life, that one feels a fresh flow of life in his veins as he looks on. Everything, the players, their costumes, the flesh tones and the accessories, is painted with masterly touch; it is a superb painting, a very fireworks of gayety; it is Rabelais interpreted with the brush.

M. Joseph Bail is another artist who is always amusing; his scullion in the midst of his stew-pans had a tremendous success last year. His "Cinderella" this year, in her kitchen, pressing against her a kitten, upon which she is lavishing all her tenderness, is a charming picture. The mother cat, ready to interfere if wrong is done her offspring, is very amusingly interpreted. The copper utensils are depicted with incredible skill, while the girl's figure proves that, when he chooses, M. Bail knows how to translate suppleness and grace.

I find in my list a large number of other works that might be mentioned, such as the superb nude figure by M. Wencker; the

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female head with its troubled eyes, styled "Lola," by Henner; the landscapes by Harpignies, Guignon, Gagliardini, Guillemet and François, whose great age is discernible in his work, but who, in spite of his eighty years, still finds his palette furnished with fresh colors. Nevertheless, a halt must be called and the works of sculpture and architecture at both exhibitions must be left to a later issue.

M. Brincourt.

Illustrations

[*Contributors of drawings are requested to send also plans and a full and adequate description of the buildings, including a statement of cost.*]

HOUSE AT THE CORNER OF WEST 76TH STREET AND WEST END AVENUE, NEW YORK, N. Y. MESSRS. LAMB & RICH, ARCHITECTS, NEW YORK, N. Y.

[Gelatine Print, issued with the International and Imperial Editions only.]

THE LAUDERDALE BUILDING, PROVIDENCE, R. I. MESSRS. STONE, CARPENTER & WILLSON, ARCHITECTS, PROVIDENCE, R. I.

This building is to be 64′ x 116′; fireproof in construction, using probably the Manhattan Fireproofing Company's material for floors and ceilings. The outside walls above first story to be of brown terra-cotta and mottled-yellow Roman brick. The first story and its cornice to be of polished dark Quincy granite. The feet and decimals, such as 24.75, signify the absolute levels above mean high-water mark, the city base from which all levels are computed. Preceded by the minus sign these figures signify levels below mean high-water mark.

DETAIL DRAWING OF TERRA-COTTA BRICK AND IRONWORK OF THE LAUDERDALE BUILDING, PROVIDENCE, R. I., FOR THE BUTLER-DUNCAN LAND CO. MESSRS. STONE, CARPENTER & WILLSON, ARCHITECTS, PROVIDENCE, R. I.

OFFICE-BUILDING FOR THE NEW ENGLAND BUILDING CO., CLEVELAND, O. MESSRS. SHEPLEY, RUTAN & COOLIDGE, ARCHITECTS, BOSTON, MASS.

DESIGN FOR GROVE HALL UNIVERSALIST CHURCH. MR. F. R. ALLEN AND MR. W. H. BRAINERD, ASSOCIATED ARCHITECTS, BOSTON, MASS.

[Additional Illustrations in the International Edition.]

SPANISH SKETCHES.

These sketches are copied from *Teknisk Tidskrift.*

MONUMENTS TO CHAPPE, AT PARIS AND TO ADMIRAL COURBET, AT ABBEVILLE, FRANCE.

These subjects are copied from *La Construction Moderne.*

"NAPOLEON I AND POPE PIUS VII."

For a description of this painting, which is copied from *L'Illustration*, see the letter from Paris, elsewhere in this issue.

"VICTOR HUGO PRESENTING HIS LYRE TO THE CITY OF PARIS." BY PUVIS DE CHAVANNES.

This plate is also copied from *L'Illustration.*

SPHINXES.

This subject is copied from *Architektonische Rundschau.*

"THE APOTHEOSIS OF GUTENBERG," BY QUINSAC. FROM *L'Illustration.*

"THE CROWN OF TOULOUSE," BY DEBAT-PONSAN. FROM *L'Illustration.*

"THE TRIUMPH OF ART," BY BONNAT.

For description of this subject which is copied from the *Builder*, see Paris Letter elsewhere in this issue.

ST. PETER'S CHURCH, STAINES, ENG. MR. GEO. H. FELLOWES PYRNNE, F. R. I. B. A., ARCHITECT, WESTMINSTER, ENG.

The above-named new church and interior copied from the *Builder*, is the generous gift of Sir Edward Clarke, Q. C., late Solicitor-General. After some unforeseen delay, the tender of 6,000*l.* was accepted. The style chosen in design is a free treatment of Perpendicular, in red brick and stone. The plan shows a nave of four bays, 26 feet wide by 80 feet in length, having a height of 40 feet to the apex of the waggon roof. The chancel, which is 38 feet 6 inches in length, is of the same width and height as the nave. Aisles, 10 feet 6 inches wide, are thrown out on north and south side of nave. A narthex is placed at the west end with western entrance. The tower, which is placed at the southwest end of south aisle, is designed in three stages and capped with a copper-covered spire. In the lower stage, on the nave floor-level, a baptistery is formed. In the upper stages, which are ornamented externally with panelled work in brick and stone, are arranged the belfry and bell-ringers' floor, respectively. A southern transept with separate entrance, forms the nave of a small chapel on the south side of chancel. Clergy and choir vestries and organ-chambers are placed on the north side of chancel, and passages are left on the north and south of chancel. The altar is elevated by steps from the nave floor-level, and ample space and height are left above and behind the altar for a baldachin or reredos. One of the main features of the church is the constructional rood-screen, which is carried right up into the chancel arch, the upper portion enriched with tracery. The central figure and cross are designed to be cut out of the solid stonework of the tracery, and the side figures placed on corbels formed in the panels of the tracery. The site of the church, facing, as it does, directly upon the River Thames, is most picturesque, but owing to the prevalence of floods, the nave floor has been kept higher than the level of any known flood. The illustration of the interior is from a drawing exhibited in the Royal Academy last year.

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VILLA RESIDENCES TO BE ERECTED NEAR SWANSEA, ENGLAND. MESSRS. WILSON & MOXHAM, ARCHITECTS.

These sketches are of villa residences to be built shortly near Swansea. One pair has already been erected. The material employed is to be red brick, with Bath stone quoins, the roofs covered with red Ruabon tiles, and the external woodwork painted a dark chocolate.

Exhibitions

Boston, Mass. — *Annual Summer Loan Exhibition of Paintings*; *also, New Accessions to the Print Department:* at the Museum of Fine Arts.

Cincinnati, O. — *Exhibition of the Cincinnati Art Club:* at the Art Museum, May 17 to June 30.

New York, N. Y — *Twenty-sixth Annual Spring Exhibition:* at the Metropolitan Museum of Art, opened May 8.

Group Exhibition by American Painters — William M. Chase, J. Alden Weir, Childe Hassam and others: at the Galleries of the American Fine Arts Society, 215 West 57th Street.

Notes and Clippings

Tampa, Fla., a Field for the Archæologist. — An archæologist claims attention for the country around Tampa, Fla, as a promising field for exploration. He says: "Within a radius of twenty-five miles of the city, there are the remains of ancient canals, numerous artificial lakes, numerous mounds, subterranean works: and the expert in Indian lore would find our tree records, Indian trails and village sites, etc., a paradise to him. There is a strong probability that Tampa is built, like ancient Rome, over the site of a long-forgotten city: Spanish Town Creek is an ancient artificial inlet; every old tree in the reservation was planted for a purpose, and bears the record of it; who will read and translate? Ballast Point has its breakwater and landings, and is rich in records. Port Tampa City covers the site of an ancient city. On the Gadsden peninsular are numerous excavations; there are trails of hard material across boggy marshes; trails to islands, trails to landings; and so many items of interest await the competent searcher, that Tampa might invite all the archæological societies in the country, and keep them busy there for a considerable time."—*N. Y. Evening Post.*

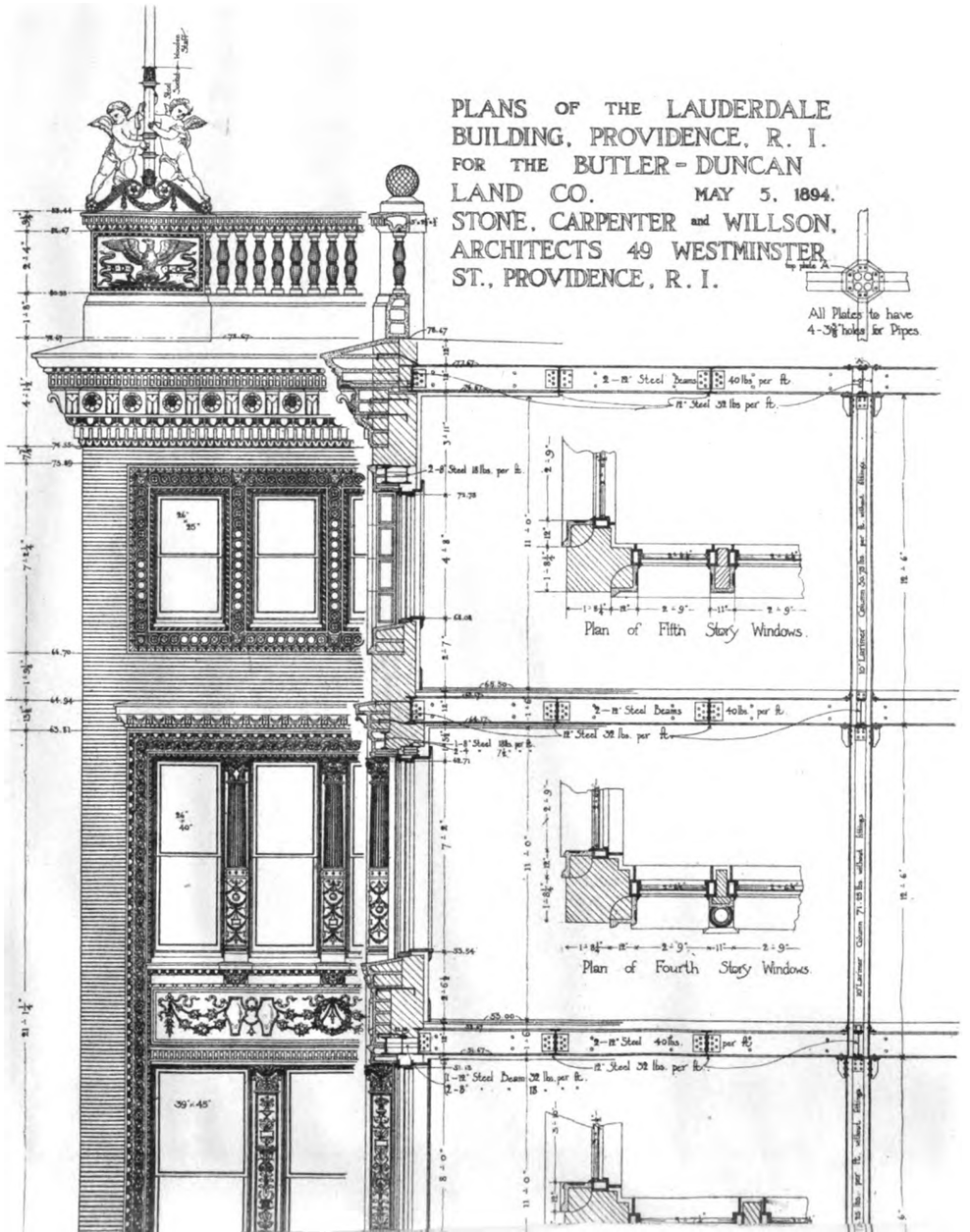
The Statue Wept. — Last winter at one of the little hillside shrines near San Remo, the Madonna was observed to be weeping. This was not seen by one, but many, as great crowds collected and watched the slowly dripping tears. The people were puzzled, bewildered, frightened, and so they called together the wisest men to find out the cause. After several days of deliberation and examination, they announced the cause of the Madonna's tears. There was a hole in the top of her head, the rain had entered and filled the cavity, and, in time, worked its way through the eyes, the pupils of which presented the thinnest portion of marble to work through. — *Rome Correspondent of St. Louis Post-Dispatch.*

S. J. Parkhill & Co., Printers, Boston, U. S. A.

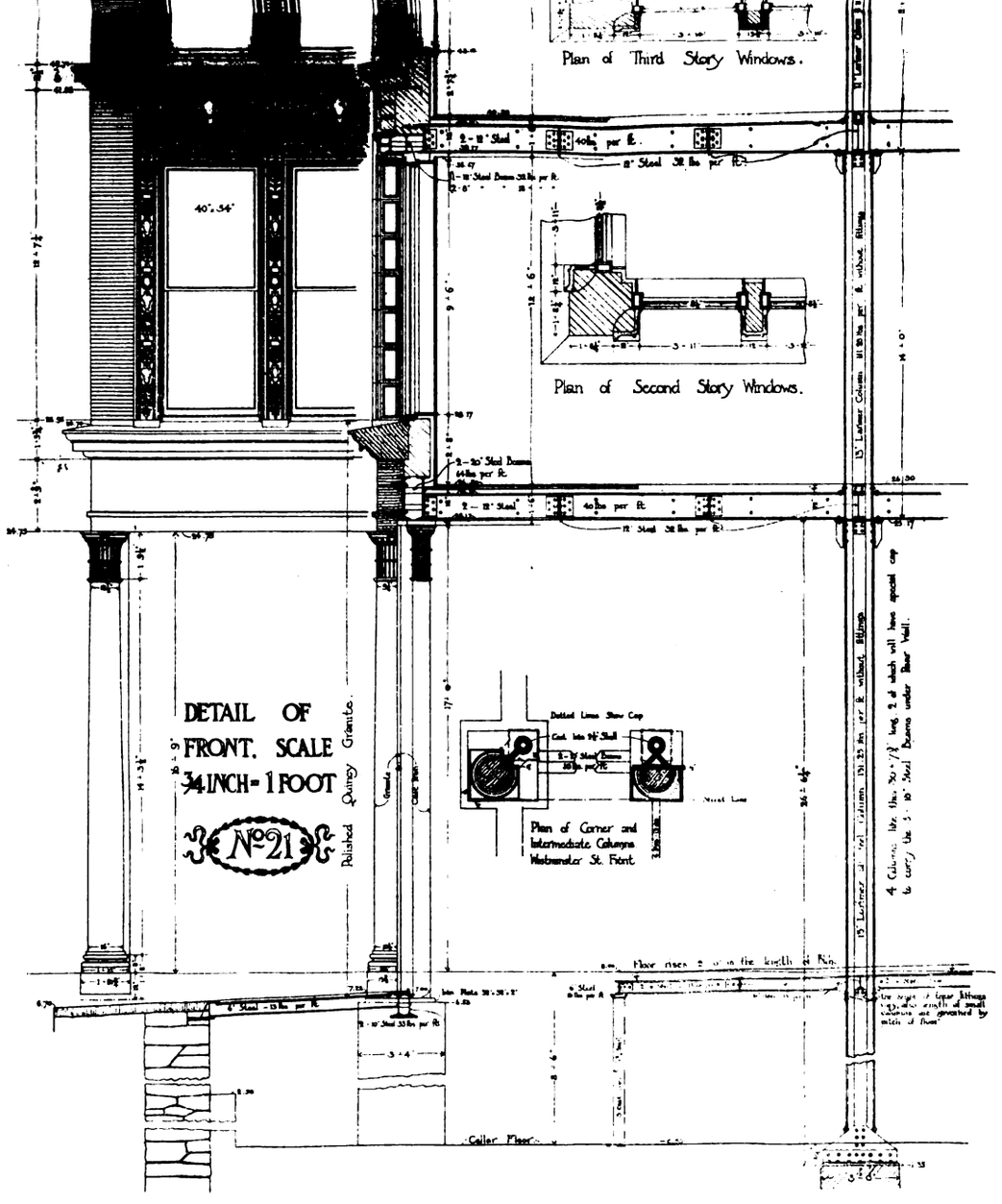
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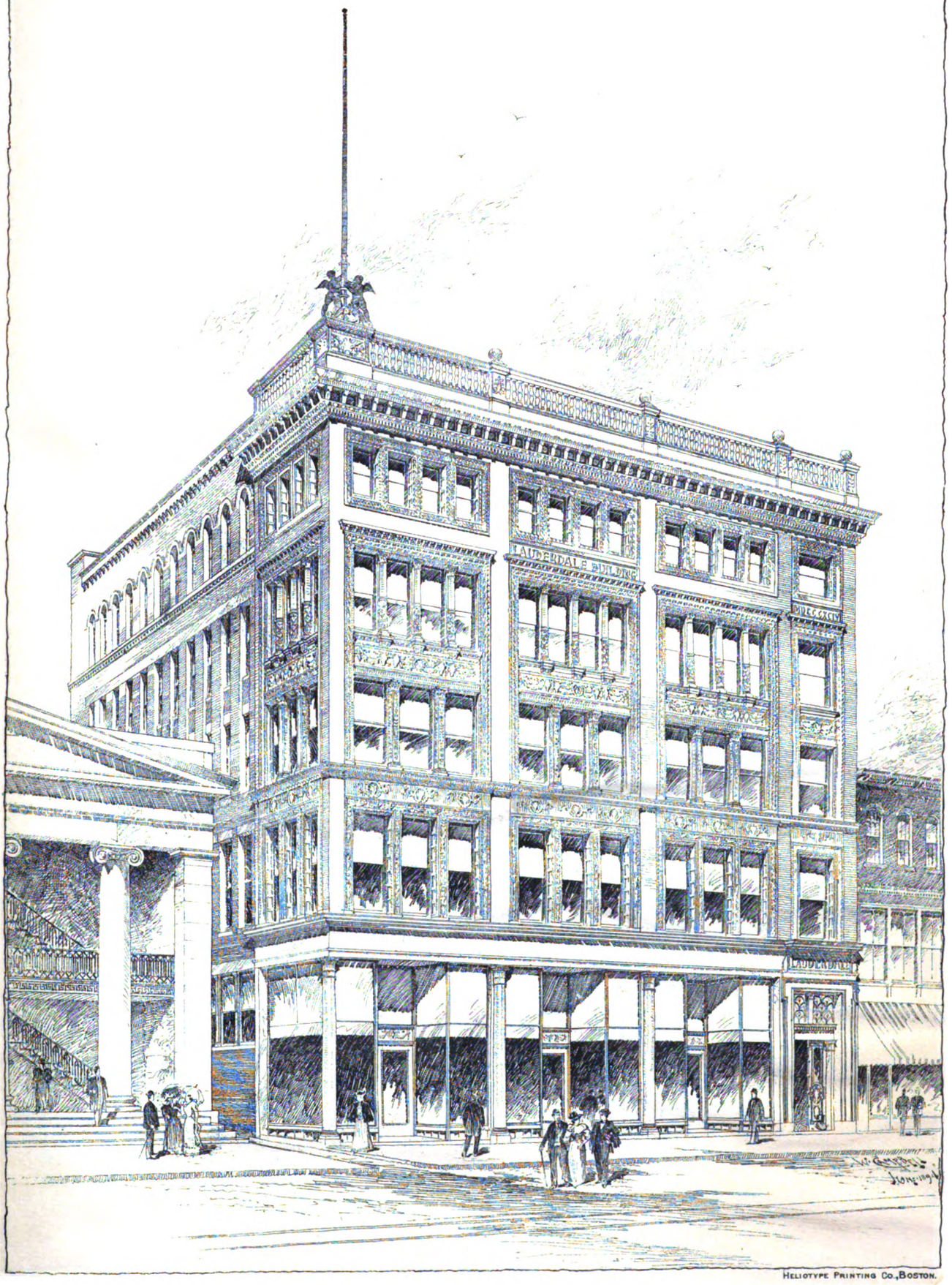
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DESIGN FOR GROVE HALL UNIVERSALIST CHURCH

FRANCIS H. ALLEN, ARCHITECT.
W. H. BRYANT, ASSOCIATE.

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The American Architect and Building News

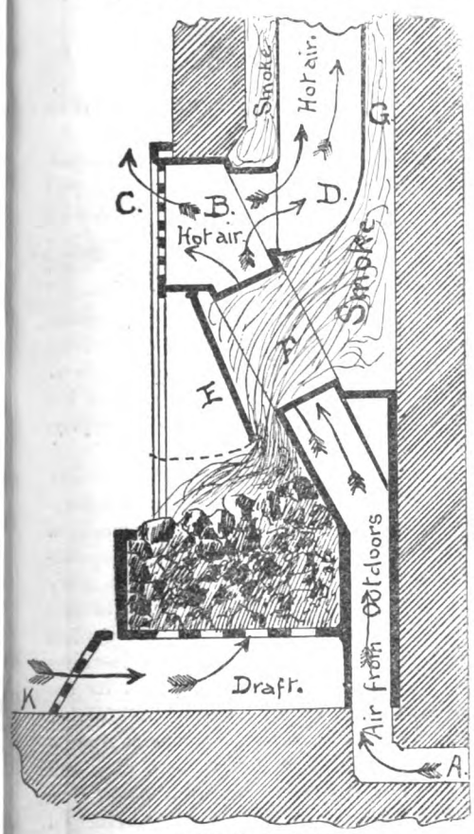
ADVERTISERS' TRADE SUPPLEMENT.

No. 140. SATURDAY, FEBRUARY 3, 1894 VOLUME XLIII No. 945.

JACKSON VENTILATING GRATE.

THE heating-power of the open fireplace has been gradually increased in the Jackson Ventilating Grates until they now stand as rivals to the furnace, steam or hot-water heater, warming a residence, it is claimed, with less fuel than either of these systems requires.

The principle of an air-chamber around the grate, introducing outdoor air, as in the furnace, and combining the indirect with direct system of heating, has been used from the first. This gives over four times the heat of ordinary grates, using the same fuel, and



Jackson Ventilating Grate.

allowing each fireplace to heat several rooms on one or different floors.

The last improvement is in the shape of the back. Instead of the vertical sides and back — as in the old form, with the opening to the flue at the top of the gate — an overhang back is introduced, and the smoke goes through this, instead of out the top. The advantage of the forward slope is apparent, as a far larger portion of radiant heat is thrown into the room, and none can, as in all other grates, pass directly from the fire into the chimney. A curtain blower hangs over the opening in the back, checking the draught, when desired, or when drawn out, acting as a hood or blower as fresh fuel is lighted. This does away with the portable blower, and gives a better control of the fire.

The back being a heavy casting of iron in a single piece, there are no joints for the leakage of gas from the fire to the air-chamber, and as they can never become overheated, those in use (of the old construction) over sixteen years, are apparently as good as new.

The cut shows the grate arranged to heat on two floors, *A* is the cold-air inlet, sending air to the chamber *B*, whence it is sent to the lower room through the register *C*, or through the pipe *D* to the floor above. The air is heated in the air-chamber before escaping to either room. The draught of the fire is supplied at *K*, the smoke passing under the curtain-blower *E*, through the opening *F*, into the smoke-flue *G*.

Architect's Catalogue "B" will be forwarded on application to

EDWIN A. JACKSON & BRO.,
NEW YORK, N. Y.

NOVELTY IN ENGINE-ROOM CONSTRUCTION.

AT the Talbot Mills, North Billerica, Mass., will be found an engine-room combining the highest degree of practical utility with an extremely ornate and luxurious appearance.

In constructing this engine-room, the only space practically available was surrounded by high buildings, and the question of securing perfect light, without interference from the other buildings, in this one-story structure, was a problem which required considerable study and skill. The engine-room was designed by Messrs. Lockwood, Greene & Co., Boston, and consists of a roof entirely of glass and metal, constructed by Messrs. E. Van Noorden & Co., Dover Street and Harrison Avenue, Boston. To more fully reflect the light, all the metal skeleton-work of the roof was painted a light color, and the walls were lined with enamelled brick. The doorway was also of enamelled brick, with rounded corners, and every effort was made to secure the utmost reflection of light, combined with an extremely pleasant and ornamental effect.

At the Naumkeag Steam Cotton Mills in Salem, there is a new engine-room, designed and constructed by the same parties as the Talbot engine-room, and an 1,800-horse-power engine has just been installed. Messrs. Lockwood, Greene & Co. are placing a number of rope-transmission instalments, and the Naumkeag engine is one of the finest types of this system. The drive-wheel is 108″ wide, to transmit 1,800 horse-power, and the belt-tower is only 13′ 6″ wide. This system replaces a gear driving plant.

In the matter of skylights, from the smallest size to entire roofs, Messrs. Van Noorden & Co. have a very high reputation, and have for years transacted a heavy business, making skylights and clover ventilators their specialties.

E. VAN NOORDEN & CO.,
BOSTON, MASS.

AN ECHO FROM THE WORLD'S FAIR.

IF you visited the World's Fair it is hardly probable that you missed the Forestry Building and the beautiful woods displayed there finished with our Hard Oil Finish, also our mammoth Redwood Plank, which was without doubt the most attractive exhibit in the building.

The plank was cut in June, 1890, in Humboldt County, California, the great tree from which the plank was hewn being 35 feet in diameter, when standing, and was supposed to have reached the patriarchal age of 1,500 years.

A part of one side of the tree had rotted, and, after it had been felled, in burning up the surrounding brush, still more of the tree was destroyed by fire, so that the width of the plank represents less than half the original diameter of the tree. The entire height of the tree was 300 feet, the plank being cut from a section of the trunk 28 feet from the ground.

The plank is the largest in the world, its dimensions being as follows: 16 feet 5 inches wide, 12 feet 9 inches long and 5 inches thick.

As we believe you are friendly to the use of our Hard Oil Finish and Varnishes it may interest you to know that among the honors gained by us at the Fair were highest awards on Hard Oil Finish, and Varnishes on woods, — six medals in all.

We take this occasion to tender our thanks for past courtesies and hope you will continue to specify our Hard Oil Finish and other Finishes, which you can do in the full assurance that results will sustain you always.

BERRY BROTHERS, Limited,
VARNISH MANUFACTURERS, DETROIT, MICH.

PRESSED AND ENAMELLED BRICK, PLAIN AND ORNAMENTAL.

THE Tiffany Pressed Brick Company of Chicago, has added to its former unexcelled product of pressed and ornamental brick (for which two awards were granted at the World's Fair), the finest quality of *Enamelled Brick*, which they claim are far superior to

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any hitherto manufactured in this country, and guaranteed fully equal to the best English enamelled brick.

Architects and contractors are invited to subject these brick to equal tests with the best imported.

It will be readily seen that great advantages are possessed over foreign companies in the ability of the "Tiffany" to deal without loss of time, with architects, contractors and owners, in reference to their wants, and a prompt filling of their orders.

The Tiffany pressed and ornamental brick have been used most extensively for fronts of the larger hotels, office-buildings, depots, clubhouses, etc., erected in Chicago and its vicinity.

The Company has a standard of its own for all of its finished product, and is willing that the "Tiffany" brick, either pressed or enamelled, shall speak for themselves.

Its enamelled brick are made of the standard English size and include stretchers, headers, quoins, bull-noses, etc.

TIFFANY PRESSED BRICK CO.,
CHICAGO, ILL.

OKONITE FACTS.

It is a fact that Okonite insulated wires and cables have the endorsement of the best electrical authorities in the world.

It is a fact that Okonite insulated wires and cables will not deteriorate, but improve with age.

It is a fact that Okonite insulated wires and cables will not crack when exposed to the severest changes in temperature.

It is a fact that Okonite insulated wires and cables will not deteriorate when placed in lime or mortar.

It is a fact that Okonite insulated wires and cables are not affected when immersed in sulphuric acid.

It is a fact that Okonite insulated wires and cables will stand a greater amount of kinking and tortion without permanent injury to the insulation than any other wire in the market.

It is a fact that Okonite insulated wires and cables are submerged in water for three days (72 hours), and then carefully tested with Thompson's Reflecting Galvanometer.

It is a fact that Okonite insulated wires and cables are tested in addition to the galvanometer test, with a dynamo current of not less than 2,000 volts.

It is a fact that Okonite insulated wires and cables when used in constructing telephone, telegraph, electric-light and railway-lines or feeders, owing to their high insulating qualities and efficiency, prove a paying investment, though the original cost may be somewhat higher than for lines constructed of cheaper material.

It is a fact that Okonite insulated wires and cables were awarded the Gold Medal at the Paris Exposition, in 1889.

It is a fact that the Okonite insulated wires and cables are more carefully made, and giving better satisfaction, and are not only the best, but cheaper in the end, than any other wires on the market.

THE OKONITE CO., Limited,
13 Park Row, New York, N. Y.

INFRINGEMENT OF THE STAR VENTILATOR.

In the Omaha *Sunday World-Herald*, of December 17, appears a paragraph in regard to an alleged infringement of the patent of Merchant & Co.'s Star Ventilator. It would seem that the Star Ventilator was specified for the Lincoln, Neb., Hospital for the Insane, and that the contractor placed other ventilators in the building, which Merchant & Co. claimed to be infringements on their Star patents. Steps were accordingly taken to stop payment on the work pending an investigation. The matter was duly laid before the State Board of Public Lands and Buildings, with the result that the Board decided to withhold a settlement with the contractor until he had made a satisfactory settlement with Merchant & Co. We are informed that Merchant & Co. have recovered heavy damages in the case. — *Metal Worker*, January 6, 1894.

REFRIGERATOR INSULATION.

One thickness of Cabot's Sheathing Quilt is equal in non-conducting power to six thicknesses of rosin-sized paper, and more than equal to three thicknesses of the best wool felt. This not only means an immense saving in first cost but in labor also, in insulating refrigerators, cold-storage warehouses, breweries, cars and in all places where a non-conductor of temperature is necessary. One of the large refrigerator-car companies has subjected the Quilt to very severe scientific tests, and pronounced it the best thing for the purpose. It is practically indestructible by decay, and is much less inflammable than any other materials used for the same purposes, as the fibre contains Silicon in place of Carbon. It will shrivel, but will not actually burn. Complete information, together with a sample of Quilt, can be had from the manufacturer,

SAMUEL CABOT,
Boston, Mass.

CHANGE OF BUSINESS.

Boston, Mass., January 1, 1894.

To our Friends and Patrons: —

You have already been notified by circular that this Company is to discontinue business, and we wish now to thank you for your kind favors and patronage.

Mr. F. L. Bailey will continue with Fiske, Homes & Co., who for the past twelve years have been the managers of this Company.

Wishing you the compliments of the season, we are, Yours truly,

BOSTON TERRA-COTTA CO.,
Boston, Mass.

As New England agents for the New York Architectural Terra-cotta Company, we are prepared to estimate upon and to contract for all kinds of Architectural Terra-cotta. We shall also continue the manufacture of Pompeiian, Old Gold and all kinds of Fire Flashed Terra-cotta at our South Boston factory.

FISKE, HOMES & CO., *Managers.*

OBITUARY.

Sidney A. Schieffelin, a member of the drug firm of W. H. Schieffelin & Co., of this city, died at his home in Geneva, N. Y., on Monday. He was seventy-six years of age.

NOTES.

Among other corporations chartered at Harrisburg yesterday was the Merchant Company, incorporated in Philadelphia, to manufacture iron or steel, with a capital stock of $400,000. The incorporators are: Clarke Merchant, Henry W. Merchant, Leslie Chase, Dallas Sanders and J. Estelle Merchant, all of Philadelphia. It is one thing to get ready to do business and another thing to go on and do it; but the incorporation of this and other manufacturing companies throughout the country goes to show that all hope has not been abandoned for the future of industrial undertakings. — *Philadelphia Record*, January 6, 1894.

The Globe Ventilator still persists in getting up in the world. Two sixty-inch Globe ventilators have just been placed on the new opera-house at Oswego, N. Y.

About a year ago, the Joseph Dixon Crucible Co., of Jersey City, issued a pamphlet on lubricating graphite. It embodied an elaborate scientific opinion by Prof. R. H. Thurston on the value of graphite as a lubricant and much interesting information on the subject from practical men. The pamphlet has had a large circulation, and the company has been enabled to obtain from well-known men a vast amount of additional knowledge on the uses of graphite. Another pamphlet, twice the size of the former, will be issued early in February, and a copy will be sent free of charge to all interested in the subject of friction and lubrication.

JOSEPH DIXON CRUCIBLE CO.,
Jersey City, N. J.

We are glad to note that our old friends, the J. S. Conover Company, of New York, have weathered the difficulties in which the financial stringency of last year involved them, and have just moved into their new building at 101 Fifth Avenue near Eighteenth Street, where they have on exhibition some of the best as well as latest designs in fireplaces, mantels, metal-work, etc.

A POLITICAL DENIAL.

To the Editors of the American Architect: —

Dear Sirs, — Some days ago the Democratic papers throughout the country copied an article from the Philadelphia *Record* stating that we "had demanded the resignation of all Democrats in our employ," and that "all Democrats had to walk the plank." This was a pure and simple misrepresentation of fact, as no demand has been made on any Democrat or Republican, and neither at that time nor for weeks before nor since has any man been discharged or left our employment.

The Philadelphia *Times* repeated the article, but added to it that we "were discharging all Democrats, and our president would in future employ no Democrats when Republicans could be obtained." When this story got as far as Pittsburgh the *Times* published the statement that "scores of Democrats had been discharged by us, which well illustrates the growth of newspaper gossip and its use for extreme partisan purposes. Still farther West and South our president was compared with the Czar of all the Russias, etc., and the statement is still extensively made that "scores of Democrats have been discharged by us." These statements had no news in them but were used to prejudice people's minds against the principles of "protection" and to favor the Wilson Bill without thought of us, any damage to us being merely an incident.

We submit to you that this is absolutely wrong in both principle and practice, and think it only fair to us from you as a newspaper that you should take notice of the case of the Keasbey & Mattison Company as an outrage on the use of the "liberty of the press." We ask you therefore to give this story full and free denial in your columns, as has been done by many leading Democratic

(Continued on page 4.)

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THE

WORLD'S FAIR EXTRA

of the

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Contains twenty gelatine prints of some of the Exhibition buildings and their details, already published in the International Edition.

Five of these prints are double-page plates, the others being single-page.

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"Your World's Fair Illustrations are exceedingly fine and are decidedly, to many of us, the most interesting and valuable of your illustrations. I propose to have them bound separately as a World's Fair Album."

W. L. B. JENNEY,
Architect of the Horticulture Building.

BOSTON, MASS.

"I have been delighted with the series of photographic reproductions of Architecture at the World's Fair published in the *American Architect.*"

CHAS. G. LORING,
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Etc. Etc. Etc. Etc. Etc.

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AMERICAN ARCHITECT & BUILDING NEWS CO., Publishers.
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The following test, made in actual work, by Col. D. C. Houston, Corps of Engineers, U. S. A., at the sea wall around Governor's Island, New York Harbor, has never been equalled by any other cement. It is as follows: Tensile strength per square inch, one day, 384 pounds; seven days, 600 pounds; thirty days, 818 pounds.

For Sidewalks it gives the best color, and the most endurable wearing surface. Most of the prominent Railroad Bridges and the large Office Buildings of the country stand upon a foundation of concrete made of ALSEN'S CEMENT.

Alsen's Portland Cement Works, New York Office, 143 Liberty Street.

papers, and notably by the Chicago *Inter-Ocean* and *Staats Zeitung*, who made a frank and handsome apology for the error, and remain, Yours respectfully,

KEASBEY & MATTISON CO.,
per Richard V. Mattison, M. D.,
President and General Manager.

The American Copper & Brass Works, of Cincinnati, Ohio, have just secured the contract for the Copper work in the large Anti-Trust Distillery, about to be erected in Terre Haute, Ind. Randolph & Clowes, of Waterbury, Conn., will furnish all the Sheet Copper and Seamless Drawn Tubes used in the work.

It is claimed that this is the largest single contract for this class of work that has ever been placed. Both the American Copper & Brass Works and Randolph & Clowes are to be congratulated upon securing this contract — it certainly demonstrates that they are "leaders" in their particular lines.

The Tiffany Glass & Decorating Company have erected a building adjoining their studios at 333 Fourth Avenue, New York, for the exhibition of their Chapel which attracted such wide attention at the late World's Fair, Jackson Park, Chicago, Illinois. It is their purpose to open it with a private view on or about February 8. Cards will be mailed from their regular list and will be sent on application to those who are interested in Christian Art in its latest developments.

BUILDING INTELLIGENCE.

Reported for the American Architect & Building News.

ALTERATIONS.

Brooklyn, N. Y. — *Rockaway Ave.*, s w cor. Sumpter Ave., four-st'y brick store and dwell., tin roof; damage by fire to be repaired; cost, $8,000; owner, C. Rampe, 35 McDougal St.; architect, Chas. Infanger, Atlantic and Van Siclen Aves.

Broadway, n e cor. Dunham Pl., four-st'y brick mill, tin roof; to be raised one story and other alterations to be made; cost, $3,000; owner, Hecker-Jones-Newell Milling Co., 2 Fulton St.; architect, G. Buchler.

Madison St., No. 653, two-st'y frame dwell., tin roof; two-st'y brick extension, tin roof, to be added and other alterations to be made; cost, $3,800; owner, F. Grasmarcer, 1065 Broadway; architect, F. Holmberg, 1169 Broadway.

APARTMENT-HOUSES.

Boston, Mass. — *Beacon St.*, cor. Raleigh St., Ward 22, six-st'y brick apartments, flat roof, 56′ x 105′; owner, Albert Geiger.

Roxbury St., Nos. 277-279, Ward 19, 2 three-st'y brick apartments, flat roofs, 20′ x 40′; owner and builder, T. F. Maguire.

HOTELS.

Bedford, Pa. — Hotel to be built at Bedford Springs; owners, S. L. Bancroft, *et al*, Wilmington, Del.

Brooklyn, N. Y. — *East New York Ave.*, n s, 76′ w Vesta Ave., three-st'y frame hotel, tin roof; cost, $7,000; owners, E. Spern & Bro., East New York and Vesta Aves.; architect, Chas. Infanger, Atlantic and Van Siclen Aves.

Mays Landing, N. J. — Three-st'y frame hotel; owners, Industrial Land Developing Company.

Nabreth, Pa. — Three-st'y stone hotel; architect, A. Hutton, 400 Chestnut St., Philadelphia.

HOUSES.

Boston, Mass. — *Vinson St.*, opp. Moreland St., Ward 24, frame dwell., 21.2′ x 27.4′; owner and builder, J. M. E. Mussett.

Parker Hill Ave., near Parker St., Ward 22, three-st'y frame dwell., pitch roof, 39′ x 52′; owner, C. J. Wood; builder, C. J. Gager.

Brooklyn, N. Y. — *Harman St.*, s s, 300′ e Irving Ave., 2 three-st'y frame dwells., tin roofs; cost, $4,000 each; owners and builders, Blank Bros., 1403 Myrtle Ave.; architect, W. B. Wills, 504 Hart St.

India St., Nos. 211 and 213, 2 three-st'y frame dwells., gravel and felt roofs; cost, $2,300 each; owner and builder, Thos. Davies, 242 McDonough St.; architect, W. H. Davies.

Wendell St., s s, 72′ 11″ e Market St., 4 two-st'y frame dwells., tin roofs; cost, $1,800 each; owner and architect, E. W. Lauer, 62 Miller Ave.

Vanderbilt Ave., n s, 22′ s St. Marks Ave., 2 four-st'y brick dwells., tin roofs; total cost, $16,000; owner, Daniel O'Connell, 420 Douglas St.; architect, J. A. Remsen, 436 Prospect Pl.

Worcester, Mass. — *Abbot St.*, three-st'y frame dwell.; owner, A. M. Taft; contractor, T. F. Melican.

Berkman St., one-and-one-half-st'y frame dwell.; owner and builder, Chas. J. Bean.

Aetna St., three-st'y frame dwell.; owner, Miss Minnie Shea; contractor, P. A. Millet.

Rock Ave., two-st'y frame dwell; owner, Mrs. Sarah C. Sanders; contractor, J. E. Woodcock.

STABLES.

Worcester, Mass. — *Houghton St.*, one-and-one-half-st'y frame stable; owner, C. C. Houghton; contractor, S. I. Howard.

Lewis St., one-and-one-half-st'y frame stable; owner, Mrs. James Clayton; contractors, Jenkins Bros.

Rock Ave., one-and-one-half-st'y frame stable; owner, Mrs. Sarah C. Sanders; contractor, J. E. Woodcock.

STORES.

Brooklyn, N. Y. — *Van Brunt St.*, s e cor. William St., three-st'y brick store and dwell., tin roof; cost, $7,500; owner, Sam Loring, 284 Van Brunt St.; architect, C. M. Dettefsen, 164 Conover St.

Fulton St., n s, 840′ e Bedford Ave., 3 one-st'y brick stores, gravel roofs; cost, $2,500 each; owner, J. O. Carpenter, 165 New York Ave.

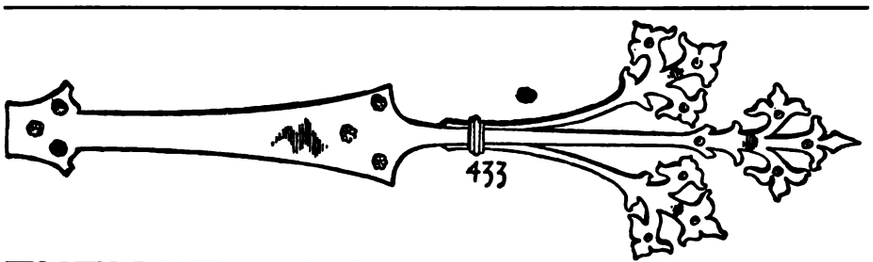
Myrtle Ave., s e cor. Sumner Ave., two-st'y brick store and dwell., tin roof; cost, $10,000; owner, L. C. Morgenstern, 1029 Myrtle Ave.; architect, F. Holmberg, 1169 Broadway; builders, Beer & Schaeffaer, 1124 Myrtle Ave.

MISCELLANEOUS.

Philadelphia, Pa. — *Glenwood Ave.*, w Twenty-second St., one-st'y foundry; owners, Fox & Son, 1936 North Twenty-third St.

Brooks, Shoobridge & Co.

7 Bowling Green, New York. ENGLISH PORTLAND CEMENT.

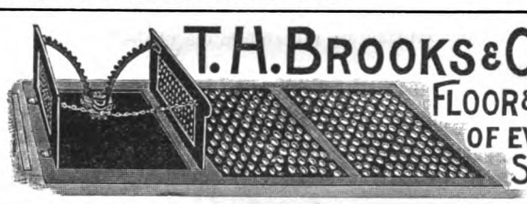


ANTIQUE HINGE PLATES

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The American Architect and Building News

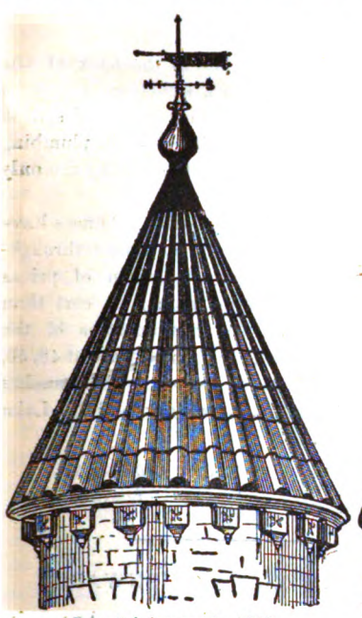
ADVERTISERS' TRADE SUPPLEMENT.

No. 141. SATURDAY, MARCH 3, 1894. VOLUME XLIII. No. 949.

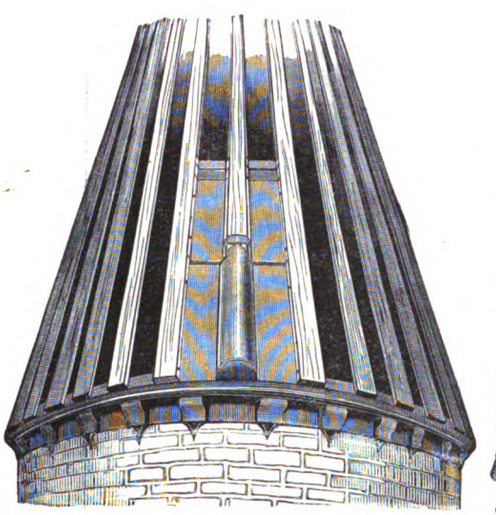
MERCHANT'S GRADUATED TILES.

SPANISH PATTERN.

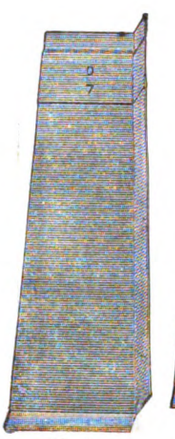
MERCHANT & Co., incorporated, of Philadelphia, with branch houses in New York, Brooklyn and Chicago, have for some time past been manufacturing a Spanish tile of sheet metal, making it of copper, steel or tin, as required. Two sizes of this tile are made, one measuring 10″ x 14″, laying to the weather 7¼″ x 11½″ and the other 7″ x 10″, and laying to the weather 5¼″ x 7½″. The tile may be described as nearly O G in form, with an interlocking joint on one side and a flange on the other, adapting it to be fastened to the sheeting boards. The general features of the tile are clearly indicated in the engravings presented herewith.



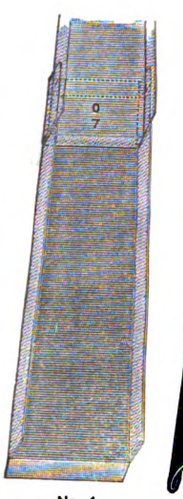
Patented January 3, 1894.



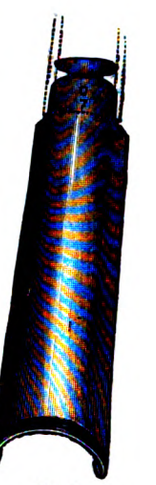
No. 2. Showing Tower sheathed with Wood Strips for laying Graduated Tile.



No. 3. Graduated Flat Tile with one edge turned as shipped.

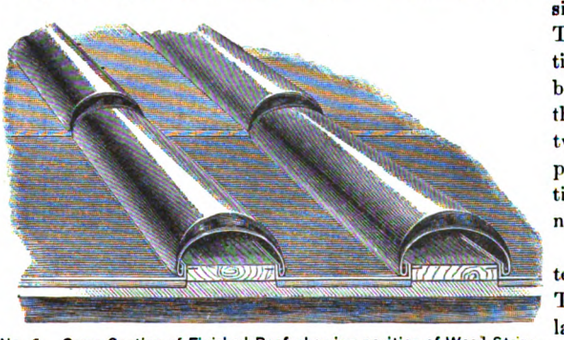


No. 4. Graduated Flat Tile with both edges turned preparatory for putting on Roof.



No. 5. Graduated Round Tile for covering wood strips.

More recently the firm have brought out what are at present known as Merchant's "Graduated" tiles, being a supplementary series to the staple pattern already shown, and specially adapted for tower work, the courses of the tile diminishing as the conical shape of the tower diminishes, thus getting an effect architecturally and mechanically correct. A tower covered with this graduated tile is shown in one of the accompanying illustrations. Graduated earthern tile have been made for many years past, but the expense of measurements, special patterns and the time involved in making and burning has prohibited the use of tile of this kind on any except the most elaborate and expensive work. The scheme underlying the construction of the graduated metal tile here illustrated is such that from a few stock patterns the parts for any tower, of whatever inclination or pitch, may be selected, thus rendering the completion of work a matter of ease and speedy accomplishment. The sectional views presented herewith show the construction of the graduated tile. Each tile consists of two parts, known respectively as the round section and the flat section. In laying, the conical roof is first established in the usual manner and then its circumference is divided into the same number of spaces as it is desired to have courses of tile. Tapering strips of wood are then nailed on the sheeting boards from eaves or base to apex. These strips are not only tapering so far as their width is concerned, but they also vary in thickness and are arranged to fit inside the curved portion of the tile, as shown in sectional view. The curved tile are made with appropriate taper in each section and with ears at the upper end for bending down and nailing to the sides of the wooden strips. There are also interlocking flanges which connect one section with another next above it, telescopic fashion. The flat tile are first put in place between the wooden strips, and nailed through the flanges to the tapering strips already mentioned. These flat tile are sent out with only one edge bent up, the other being bent as required by the person laying the tile, using for the purpose ordinary tongs, and thus securing a perfect fit. After the flat part is in position the round part is put in place, the successive courses being overlapped and interlocked as already described. The firm are making at present no less than thirty-two sizes of this tile, and offer to supply on short notice the covering for any tower, the correct dimensions of which may be supplied them. They send with each order a specification of the wood strips, giving width at bottom, length, thickness of bottom and thickness of top, together with space between strips at the bottom, and then point out that for the several courses the tile of such and such quantities of given numbers will be required.



No. 6. Cross Section of Finished Roof, showing position of Wood Strips.

The process of laying will perhaps interest the reader in this connection. Two courses of the flat tile are first laid, beginning at the eave, using the largest size of whatever section has been made for the tower, with the upturned edges fitting between the wooden strips, and nailing as shown in the cross-section. In laying the second course it overlaps to the recess formed in the top end of the ower tile. Then the curved parts of the

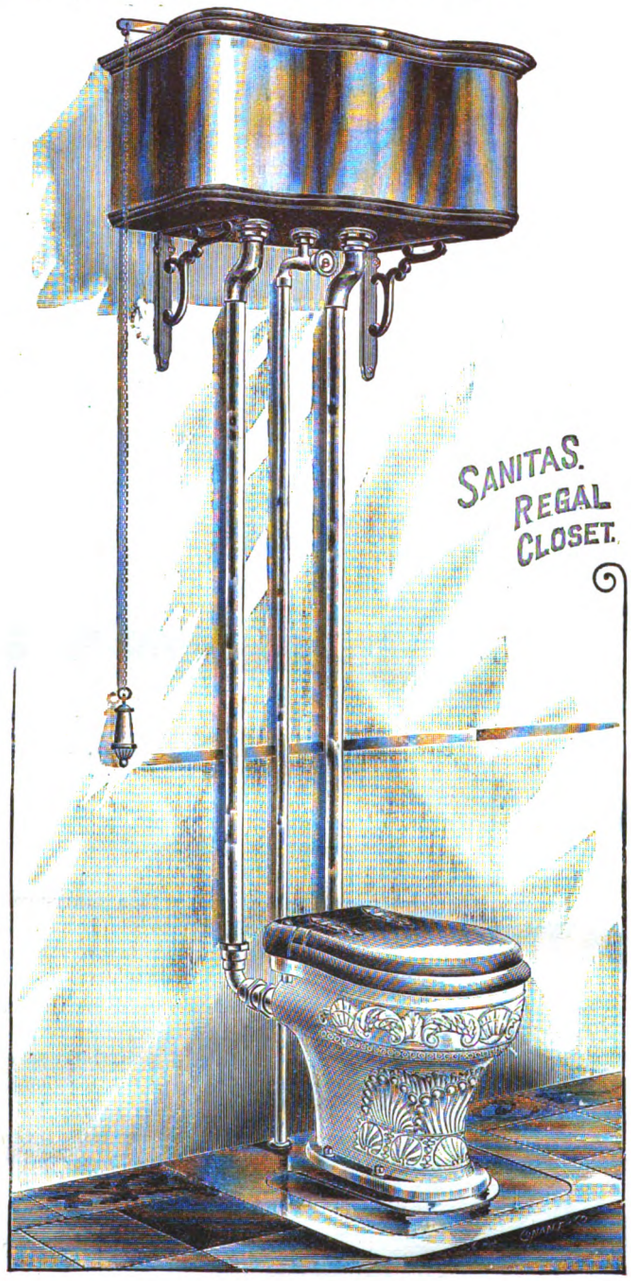
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same course are put on, using for each course the tiles numbered the same as with the plain portion already in position. As these are laid they are nailed into the wooden strips through the ears at the upper end. The lower end of the first course is fastened by nailing the overturned portion of the strip in the succeeding courses telescoping into the courses below, and requiring fastening only through the ears into the upper ends as already described. Each tile has its number stamped on it, No. 1 being the largest and No. 8 being the smallest. Intermediate numbers are also supplied, being designated by the prefix O.

MERCHANT & CO.,
PHILADELPHIA, PA.

SPECIAL FEATURES OF THE SANITAS REGAL CLOSET.

It is the quietest in action of any closet made, being practically noiseless. This result is accomplished by having a suspended column of water in the standpipe, making the action instantaneous and deadening the sound. By this construction the water-seal in the closet-trap is automatically maintained, and the objectionable noise of a body of water suddenly falling from the tank to the closet is entirely avoided. The Sanitas Regal is the only closet on the market having this feature.



1. It is symmetrical in form, combining beauty with stability; the embossed pattern being modelled in a design suitable for harmonizing with any style of interior finish.

2. The surface of the standing-water is very large and at the most desirable distance from the seat. It has the shape best calculated to receive and deodorize the waste-matters falling into it. The water is very deep at the back of the closet and the deepest at the point where the wastes strike.

3. All parts of the trap and bowl are visible, insuring scrupulous cleanliness. There is no invisible trap below the bowl to become fouled.

4. It combines both the jet and the siphon principles.

5. Instantaneous flushing is attained by having the supply-pipe always full of water, and all delay and loss of power occasioned by the water falling from the tank through the pipe, and against the resistance of the enclosed air, is avoided.

6. All unpleasant odors are drawn downward, as the movement of the air-current is in that direction, following the discharge from the closet-bowl. In ordinary closets the air in the flush-pipe is, by force of the falling water, driven out into the room, charged with noxious odors from the closet-bowl. In the Sanitas Regal Closet there is no air in the flush-pipes to be expelled.

The first action of the closet is through the jet, which forces the wastes out of the bowl, creating at the same time, the suction which draws down all foul air. No other closet in the market has this downward suction, but all have the objectionable rush of air through the flush-pipe and into the room.

7. To still further minimize this trouble, the closet is provided with a large local vent in combination with the overflow pipe.

8. The combination of the accessible bowl and trap, from which the water in the closet can all be removed at pleasure. It can be easily emptied by a sponge or rubber tube, thus preventing freezing when the house is closed during the winter.

9. There can be no loss of seal by evaporation or siphonage, as long as there is any water in the pipe; the flush-pipe being full of water, automatically restores any loss there may be from any of these causes.

10. The seat of the Sanitas Closet is attached directly and firmly to the porcelain, and is not connected with the wall. The back part of the closet is as accessible for cleaning as the front part, and the sanitary efficiency of the apparatus greatly enhanced thereby.

11. Freedom from breakage is secured in the Sanitas Closet by using patented flexible couplings and slip joints.

A retarding chamber at the back of the bowl holds in reserve a sufficient supply of water to ensue a maximum depth of seal in the trap. This feature is unique in plumbing apparatus, the Sanitas Closet being the only one having it.

The merits of the Sanitas Appliances have been recognized by leading sanitarians throughout the world, and a comparison of prices shows them to be no higher in cost than ordinary goods. The headquarters of the makers, the Smith & Anthony Co. are at 48, 50, 52 and 54 Union St., Boston, with Branches at 56 Beekman St., New York, and 217 Lake St., Chicago.

SMITH & ANTHONY COMPANY,
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VITRIFIED EARTHENWARE.

Vitrified earthenware is made by so mixing the material that in the process of firing the glaze and the clay become thoroughly fused or melted together, making the body of equal density all the way through, and absolutely impermeable to water or acids, securing great strength and positive immunity from crazing or crackling, insuring durability and consequently adding immensely to the value while only moderately enhancing the cost, and has been adopted, and is now being called for by the United States Government. We firmly believe that Vitrified Ware (because it is better) will surely supersede the common ware (whether imported or domestic) for sanitary goods, water-closets, urinals, wash-basins, etc.; and desiring still to be found in the front ranks in the march of improvement, we hereby announce the fact that we are now prepared to receive orders for our specialties made of this material, assuring our patrons that the superior quality of the goods will more than compensate for the slight advance in the cost. We are confident that architects will appreciate the advantages to be gained by the use of Vitrified Earthenware, and take pleasure in extending a cordial invitation to call and examine samples.

FRED ADEE & CO.,
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ALSEN'S PORTLAND CEMENT

is the strongest and most serviceable Cement made, and will permit the admixture of a larger amount of sand or gravel with less loss of strength than any other brand; it is therefore the most economical. It is the finest ground cement made, and has the largest bulk to the barrel.

The following test, made in actual work, by Col. D. C. HOUSTON, Corps of Engineers, U. S. A., at the sea wall around Governor's Island, New York Harbor, has never been equalled by any other cement. It is as follows: Tensile strength per square inch, one day, 384 pounds; seven days, 600 pounds; thirty days, 818 pounds.

For Sidewalks it gives the best color, and the most endurable wearing surface. Most of the prominent Railroad Bridges and the large Office Buildings of the country stand upon a foundation of concrete made of ALSEN'S CEMENT.

Alsen's Portland Cement Works, New York Office, 143 Liberty Street.

NOTES.

MESSRS. N. & G. TAYLOR CO., Philadelphia, have again out-distanced their competitors and have scored another victory for the Genuine Taylor "Old Style" brand of extra heavily coated roofing-tin. This fine brand was selected and is now being used on the Fourteenth Regiment Armory, Brooklyn, N. Y., first shipment made being over a carload. It is also used on the Inman Line Steamship Company's Pier, North River, New York. This contract took over two hundred boxes of the Taylor "Old Style" brand. The Grocers' Exchange Building has just been covered with it, and many other buildings in and about New York City.

Those wanting a *first-class tin roof* should ask for the Taylor "Old Style"; every sheet is stamped or embossed with the name of the manufacturers, N. & G. Taylor Co., Philadelphia, the thickness of the tin, and the brand "Old Style," without which none is the genuine.

THE Samson Cordage Works, of Boston, have issued their 1894 catalogue and call especial attention to their "*Samson Spot Cord.*" This cord has been put on to the market the last year to supply the demand that the architects have made for a first-quality sash cord, which should be so marked that it could be identified at sight, after the label has been removed, from the low-grade cords which are bought on account of the low price rather than on account of their wearing qualities. The "Samson Spot Cord" is the same quality and price as the regular "Samson" cord, which has for years been so favorably known, marked with a succession of spots of a different color from the body of the cord. The Company has adopted this device as a trade-mark. Their catalogue describes this cord as being warranted of perfect braid and finish, and to be entirely free from waste stock, and purchasers may have confidence that the spot is a guarantee of quality. Samples will be gladly sent on application.

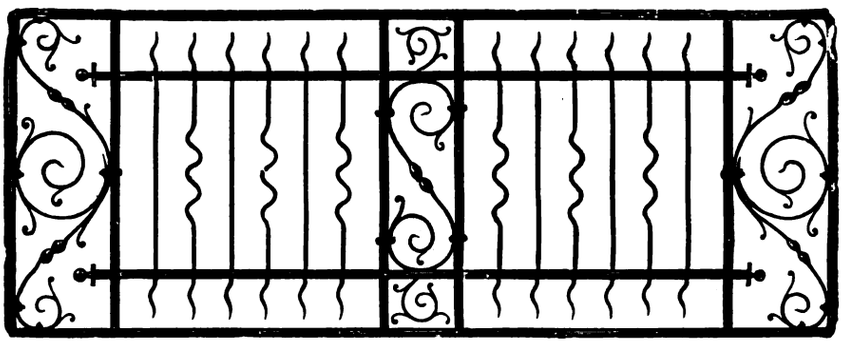
WE desire to call attention to the very extensive and complete layout of refrigerator work put in the Exchange Club, Boston. These refrigerators are all finished in the best possible style, according to the Wickes System, with quarry-tiled floors, etc. This will probably be the most complete refrigerating plant in any club in the United States. It comprises a number of boxes on each floor throughout the house, with large storage-rooms in the cellar and fifth floor.

We are also putting in a complete layout in the Stafford House, Baltimore — the plant consisting of a Westinghouse machine and Wickes patent boxes throughout the house. There is a separate refrigerator for every suite of rooms, which is rather a new idea in the refrigerator line.

We would also call attention to a very handsome porcelain-lined refrigerator-room lately completed in Mr. Bergner's house in Ambler, Pa., which is considered the most perfect plant in detail and as regards finish in this country,— the separate compartment being provided for all the different fruit products, and the whole lined with porcelain inside and out.

There is also a separate compartment for storage of ice; also complete arrangements for cracking ice and holding it in a small marble-lined sink.

THE WICKES REFRIGERATOR CO.,
NEW YORK, N. Y.



SUITABLE FOR BANK AND OFFICE USE.
MADE TO ORDER BY
J. B. SHANNON & SONS,
1020 Market Street, - - Philadelphia.

BUILDING INTELLIGENCE.

Reported for the American Architect & Building News.

APARTMENT-HOUSES.

Boston, Mass. — *Kensington St.*, Ward 21, three-st'y frame flats, flat roof, 28' x 60'; architect, Jos. G. Lafield, 12 Pearl St.

Chicago, Ill. — John Eblad, three-st'y flats, 13 Pleasant St.; cost, $3,500.
T. Anderson, three-st'y flats, 523 Evergreen Ave.; cost, $5,000.
Fred. Planert, three-st'y flats, 392 North Roby St.; cost, $6,000.
Mandel Brothers, 3 four-st'y flats, Rhodes Ave. and Thirty-seventh St.; cost, $33,000.
Frank Filek, three-st'y flats, 151 West Nineteenth St.; cost, $3,500.
Charles Scheubert, two-st'y flats, 464 Hastings St.; cost, $3,500.
Anton Havazine, two-st'y flats, 4645 Wood St.; cost, $3,000.
Alfred Major, two-st'y flats, 5647 Green St.; cost, $3,800.
W. Pougratz, three-st'y flats, 3251 Lowe Ave.; cost, $6,000.
O. Hansen, three-st'y flats, 181 Barclay St.; cost, $5,500.
John Corswandt, two-st'y flats, 712 Campbell Ave.; cost, $3,500.
Fred. Schleisler, three-st'y flats, 136 Bissell St.; cost, $6,000.
F. Anderson, three-st'y flats, 769 Maplewood Ave.; cost, $6,000.

BUILDING INTELLIGENCE.

(*Apartment-Houses Continued.*)

M. O. Tremain, three-st'y flats, 4827 Forrestville Ave.; cost, $8,000.
L. A. Cross, two-st'y flats, 1254 Monroe St.; cost, $3,000.
Emil Schintz, three-st'y flats, 341 Thirteenth St.; cost, $6,000.
F. J. Tank, three st'y flats, 1541 Adams St.; cost, $8,500.
C. Comisky, two-st'y flats, 725 Turner Ave.; cost, $4,000.
James Linden, three-st'y flats, 499 Fairfield Ave.; cost, $8,000.
H. Butler, three-st'y flats, 605 Kedzie Ave.; cost, $8,500.
Dr. W. S. Cox, two-st'y flats and barn, 1315 Jackson Boulevard; cost, $3,000.
T. J. Innes, two-st'y flats, 2936 Emerald Ave.; cost, $4,000.

Minneapolis, Minn. — *South Sixth Ave. and Ninth St.*, three-st'y brick flats, cost, $80,000; owner, T. P. Linne.

THEATRES.

Harrisburgh, Pa. — Plans to be prepared for a new Opera House; architect, J. D. Allen.

WAREHOUSES.

Philadelphia, Pa. — Ten-st'y brick and stone warehouse; owners, Fidelity Storage and Warehouse Co.; architect, Charles Balderston, 144 South Fourth St.

MISCELLANEOUS.

Baltimore, Md. — Estimates are being made for a new building on corner of Constitution and Monument Sts., for the Bush Electric-light Co.
Fire engine-house, cor. North Ave. and Bond St., cost, $15,000; also a hook and ladder-house on Lafayette Ave., near Sticker St., cost, $1,700.

Boyertown, Pa. — *Fifth St.*, foundry and machine-shop will be built.

Camden, N. J. — Two-st'y stone building; cost about $40,000; owners, Hatch Post, No. 37, G. A. R.

Homestead, Pa. — The land between Homestead, Tompson Station and Duquesne, will be laid out in a new town by the Pennsylvania Railroad and the Carnegie Companies.

Lancaster, Pa. — Two hundred and fifty acres of land, near Lebanon, is to be laid out in a new town. Manufacturing establishments are to be built; work to begin at an early date. The syndicate is represented by John Heimenz, the brewer, and several Trenton, N. J. capitalists.

Philadelphia, Pa. — *Lancaster Ave., No.* 4115, three-st'y building to be built; owner, J. L. Schneider.
Market and Twenty-first Sts., fire-house to be built; cost, $42,000; contractor, Thomas Seeds, Jr.
Wyalusing Ave. and Fifty-first St., two-st'y frame and iron crematory for Dooley Bros., garbage contractors; contractor, S. G. Smith, 617 City-hall.
Dauphin St., cor. Twenty-fifth St., crematory for the Philadelphia Chemical Cremating Co.

Telford, Pa. — A large building to be used as a public hall will be built by Monroe Hartzell.

Washington, D. C. — *M St.*, n w, near Fifteenth St., three-st'y dancing academy to be built; owner, Prof. Allen de C. Mueller.

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THE

WORLD'S FAIR EXTRA

of the

AMERICAN ARCHITECT.

Contains twenty gelatine prints of some of the Exhibition buildings and their details, already published in the International Edition.

Five of these prints are double-page plates, the others being single-page.

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D. H. BURNHAM,
Late *Chief of Construction.*

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W. L. B. JENNEY,
Architect of the Horticulture Building.

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CHAS. G. LORING,
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THOS. P. LONSDALE, *Architect.*

CAMBRIDGE, MASS.

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C. H. McCLARE, *Architect.*

DULUTH, MINN.

"Best plates, so far published, that we have seen."

TRAPHAGEN & FITZPATRICK, *Architects.*

NEW YORK.

"By far the most satisfactory representations of the Fair that have been published."

MONTGOMERY SCHUYLER,
Author of "Studies in American Architecture."

Etc. Etc. Etc. Etc. Etc.

! FREE !

This "World's Fair Extra" will be sent free to *new* subscribers to the International Edition of the *American Architect* for 1894.

AMERICAN ARCHITECT & BUILDING NEWS CO., Publishers.
211 Tremont Street, Boston.

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The American Architect and Building News

ADVERTISERS' TRADE SUPPLEMENT.

No. 142. SATURDAY, APRIL 7, 1894. VOLUME XLIV. No. 954.

ART IN METAL WORK OF GLASS SETTINGS.

WHEN the "master builders" of the Middle Ages (the "Architects" of those days) abandoned the Roman-basilica in which there was ample wall-space for paintings, and developed the Gothic, they then "transferred" the frescos from wall to window. In doing this they consistently adhered to the use of strong lines to accord with Gothic feeling. Their colors too, were in low, pure tones. In after years there came a debasement of true Gothic expression and then stained-glass windows became, not a part of a whole, but apart in their character — the strong lines were lost and strong color came in.

In this present "nineteenth-century revival of art" stained-glass has gone on a mission of its own, and through its expression of a forced feeling for the utterly artistic (at times gorgeously fantastic, particularly in church windows) the lay mind has become palled, and the reverent mind has recoiled.

A reaction has come in and expressed itself in an almost utter overthrow of this modern art error.

The possibility of adapting the old idea to new requirements has come through the inventions of the Metallic Setting Company of Providence, R. I., in cutting out lines in hard metal to give "line and mass," which dignify by accord with architectural effects.

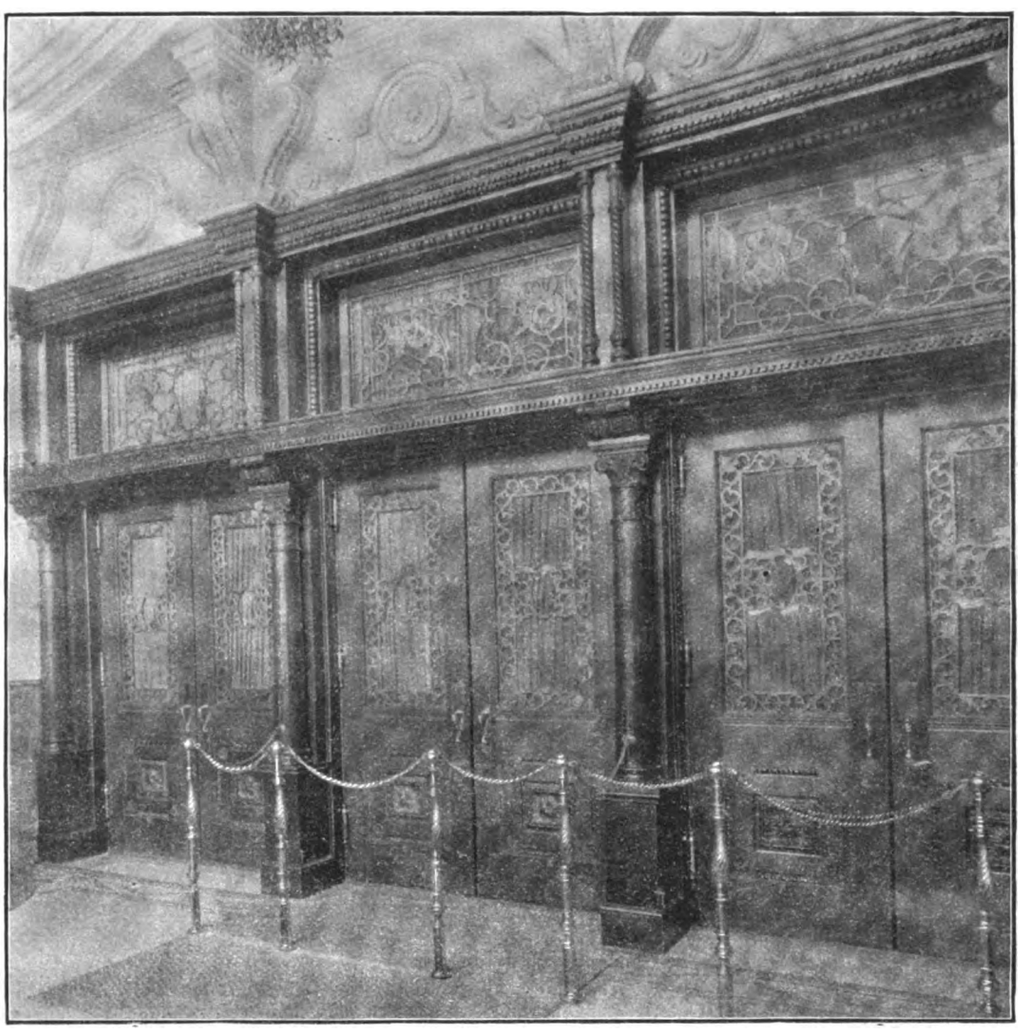
The Metallic Setting Company was organized in May, 1892, to make the Lee Patent Copper or hard metal setting for glass. In January, 1893, a thoroughly equipped shop was ready with full facilities, with designers and skilled workmen to develop special artistic features for which this invention is so happily adapted.

In addition to house work and church windows, this Company have equipped the new Abbey Theatre, Broadway and Thirty-eighth Street, New York, and Keith's new Opera-house, Boston, with their designs in glass-setting which are magnificent in effect.

This setting, because of its lightness, stiffness and durability, is most admirably adapted for doors, etc., in steamships, also for palace-cars.

Their designs have had the commendation of many eminent architects, as the method makes possible a thorough expression of any architectural movement in the metal itself.

SCOTT A. SMITH.



Vestibule of Abbey's Theatre, Broadway and 38th Street, New York City.

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THE GURNEY STEAM BOILER.

The Gurney Hot-Water Heater Co., notwithstanding the alleged hard times, makes its spring bow to the public, and to the steam-fitting trade, with its usual product of new goods, and this year the managers of this energetic concern think they show more than their usual enterprise.

As the Company's name indicates, it has from the first been very earnest in its advocacy of water as a medium for heating, and its loyalty to the faith as expressed in its name seems to be no less now than in past years, although it has come out with a full line of Steam-heating goods. The explanation is found in the fact that whereas originally the Company had for its competitors only concerns making Hot-Water Heaters, through consolidation of interests, the Company finds itself now compelled to meet in the market other concerns controlling both steam and water apparatus, and the uniform success of the Gurney Company in producing heating apparatus should command the careful attention of those interested in Steam Boilers.

It will be seen by an examination of the accompanying cuts that the boiler is a direct surface-burner, it being claimed that the fire-surfaces are so effective and extensive, in proportion to grate-surfaces, and so staggered that there is not left in the gases after passing over the surfaces, more heat than there should be to operate successfully in an ordinary chimney, such as is usually supplied for this class of heating apparatus. The boiler is claimed to be very quick, indeed as quick as anything that has hitherto been offered, or as the manufacturers say, "as quick as it should be," in view of the class of place in which it shall be used.

A careful examination of the cuts will show that every provision has been made to secure a steady water-line, and the Company claims that the means used are ample to secure this very desirable result. Every provision is made that is necessary for the removing of ashes, both from the ash-pit and from the surfaces, the approaches to both being ample, indeed, as much so as is possible, consistent with avoiding the waste of heating-surface.

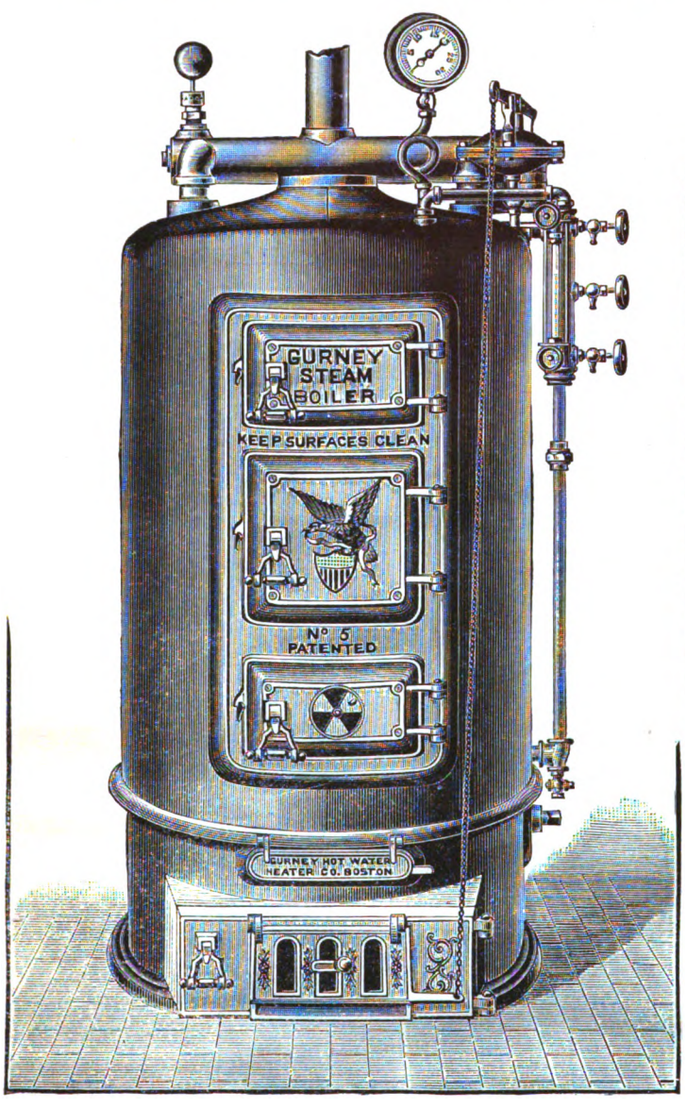
One very valuable feature that will commend this apparatus to the fitting trade is, that it is shipped in only three pieces. The body of the boiler is in only two pieces, and there are not any water or steam joints that requires packing, the joints being in every instance screwed joints, or iron to iron.

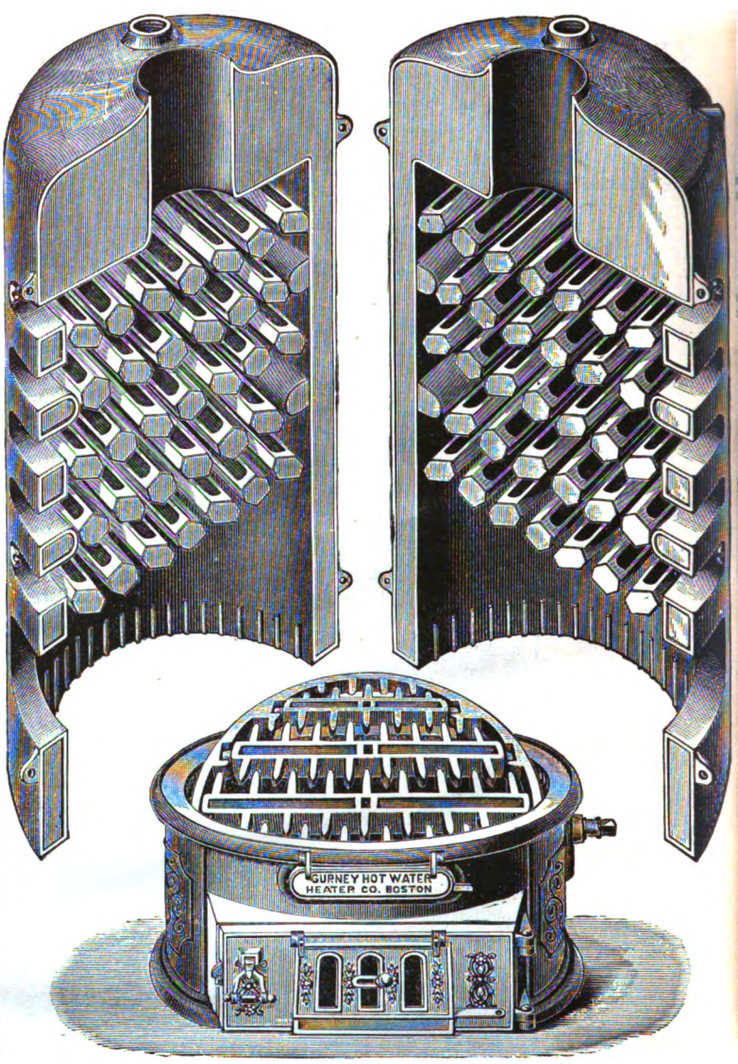
The boiler is undoubtedly simple, indeed as simple as an apparatus of this kind can be made, and the Company recommends its clients in setting the boiler, if it is thought desirable, to cover with an asbestos or mineral-wool covering, so that the simplicity of construction may not be minimized in the mind of the operator.

The boiler has been thoroughly tested, and its value ascertained by practical operation, and in addition to this, the Company has, as usual, employed an expert to determine its relative value as compared with the established standards. In this instance the Company has employed W. J. Baldwin, M. E. of New York City, an expert in steam heating, and one of great experience and established reputation. Referrin g to the test of their steam boiler he says: — "The performance of the boiler during the trial was admirable, being steady and reliable, so that the steam did not vary half a pound in pressure at the times of firing," and further states, "I never tested a boiler that gave as high an efficiency of evaporation per square foot of boiler-surface."

The Gurney Hot-Water Heater Co. will be very pleased to furnish full descriptive circular of their new steam boiler upon application.

THE GURNEY HOT-WATER HEATER CO.
BOSTON, MASS.





FOLSOM'S PATENT ROOF SNOW GUARDS.

The New Model Folsom Snow Guard is a marked improvement over the old pattern, its peculiar construction adding a third to its strength, and retains the valuable feature of not depending upon the slate to resist the strain. All architects who have had attention called to it have adopted it. The Folsom method of protecting roofs is simple, scientific and correct, and is rapidly supplanting the old method which holds the snow in a large drift upon a guard rail with its attendant annoyances and danger.

The New Model Folsom is the only satisfactory guard and should be specified to prevent the substitution of imitations.

C. R. WHITCOMBE, *Agent*,
33 Lincoln Street, Boston, Mass.

ALSEN'S PORTLAND CEMENT.

Referring to the recent controversy regarding the merits of the German and English Portland cements that appeared in several numbers of the *American Architect* a few months ago, we exhibit herewith a copy of

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tests made last month of Alsen's Portland cement by Mr. C. B. Marriott, City Cement Inspector, of Baltimore. These tests show a remarkably strong cement, and one of particularly high practical value, as shown by the sand test, exceeding in that respect the value of any English Portland cement by nearly fifty per cent. We would ask you to be kind enough to mention these tests in your next issue, as they must certainly be of interest to both architects and engineers.

SINCLAIR & BABSON,
NEW YORK, N. Y.

For fineness — No. 50	Trace.
For setting — initial	4 h. 10 m.
For tensile.	
7 day test, neat	723 lbs.
7 " " "	748 "
7 " " "	806 "
Average	759 lbs.
7 day test, 1 cement to 2 sand	318 lbs.
7 " " "	302 "
7 " " "	337 "
7 " " "	390 "
Average	336¾ lbs.
7 day test, 1 cement to 3 sand	206 lbs.
7 " " "	208 "
7 " " "	255 "
7 " " "	282 "
Average	237¾ lbs.

Crushing test.—7 day test, 1 to 2, could not be crushed upon a machine capacity 1,025 pounds to the one inch.

7 day test, 1 to 3 sand, 790 lbs.

Percentage of water in mortar, neat	22½%
" " " " " 1 to 2	13%
" " " " " 1 to 3	12½%

Temperature in air 72° Fahrenheit; water 68°; color, good; a chemical cement; no expansion; no cracks or distortions.

(Signed) CLARENCE B. MARRIOTT,
City Cement Inspector,
BALTIMORE, MD.

SANITARY SPECIALTIES.

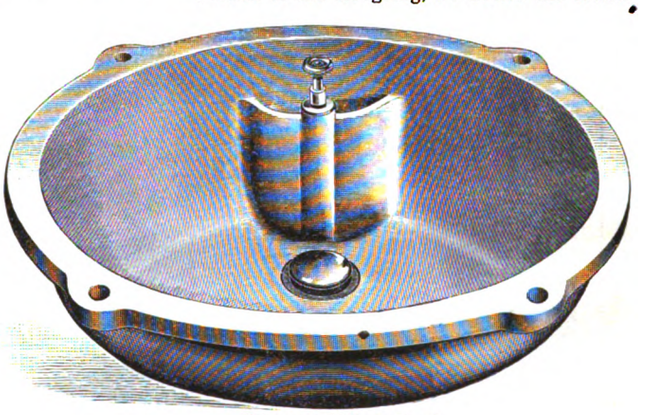
THIS combination, which consists of a finely-shaped oval basin, with one and one-half-inch waste coupling, device for opening and closing the waste, the buttons and bolts for securing bowl to slab, the working parts made from a very hard silver metal which will always retain its color (no plating or replating), the top flange of bowl ground to fit the slab, is simply what its name implies. The stopper, by turning to a given point, may be taken out if it should be necessary to remove any obstruction. The lift-rod works through a brass tube inserted in the aperture in the earthernware, and is tightly packed with litharge and glycerine to prevent lodgment of foul matter. The space around front of waste-coupling is also similarly packed, and, finally, the overflow being large and so accessible as to be easily kept clean, secures, we think, sanitary qualities which are not possessed by any other.

This "Complete" Basin, No. 2, with the exception of the overflow, which is placed in a recess, is the same as the No. 1.

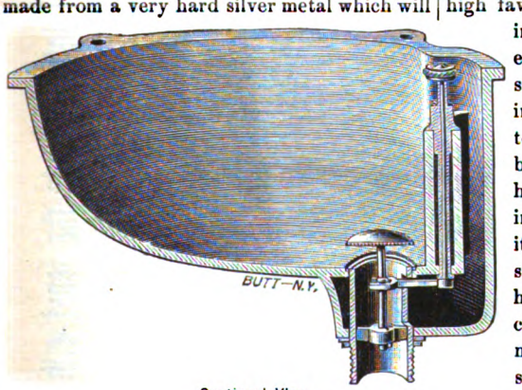
FRED ADEE & CO.,
NEW YORK, N. Y.



"Complete" Basin No. 1.



"Complete" Basin No. 2.

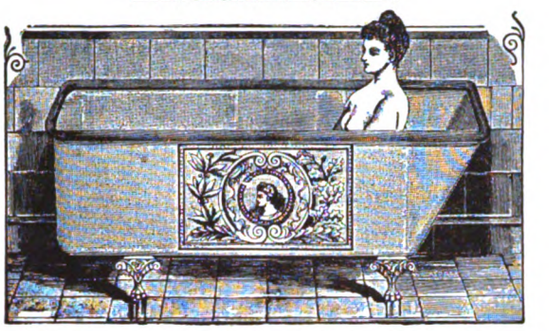


Sectional View.

THE BISCHOFF SHEET STEEL BATH-TUB.

ENAMELLED.

THE CHEAPEST AND BEST SANITARY BATH ON THE MARKET.



SEND FOR OUR ILLUSTRATED CATALOGUE AND PRICES.

FRED. F. BISCHOFF & CO., 24-26 West Lake St., CHICAGO.

CHROME CAST STEEL.

ONE of the busy establishments of the times is that of the Chrome Steel Works of Brooklyn, N. Y., whose product is the well-known Chrome Cast Steel. The abundance of orders which has kept these large works running full time with full number of hands during the past year, despite the lengthy period of general trade dullness, speaks volumes for the high favor which this material has obtained in this country. Chrome steel differs essentially from ordinary steel in the substitution of Chromium for carbon in its manufacture. It is very hard, tough and dense, will not deteriorate by the continued application of great heat, and can be worked successfully in large masses. These qualities adapt it especially for the manufacture of such castings as gears, wheels, pinions, hammer dies, etc., etc., for general machine construction. Its use in this connection is extending rapidly. Chrome steel is also particularly well-suited and desirable for the manufacture of castings for stamp-mills for mining, in fact reports of its use for such work are flattering in the extreme.

Many of the largest mining companies throughout both North and South America have discarded the use of iron or ordinary steel battery shoes and dies, cams, tappets and bosses, crusher-plates and roll-shells which they have heretofore been using, for those made of Chrome steel. The shoes and dies that are made of this particular kind of steel, it is claimed, will not cup, neither will the shoe break at the shank. They will moreover wear evenly from end to end, thus crushing more ore than shoes and dies of iron, which, as all mill men know, wear irregularly and are in the main short-lived. The State Mineralogist of California in his Eighth Annual Report says of Chrome Steel Shoes and Dies as used in the *Patterson Mine*, (p. 656), ". . . One set of iron shoes and dies lasting six weeks and crushing about one thousand six hundred and eighty (1,680) tons, while one set of Chrome Steel Shoes and Dies is said to have lasted fourteen months and wore even, which indicates a crushing of sixteen thousand eight hundred (16,800) tons, or just *ten times the amount crushed by iron.*" In addition to the foregoing, we notice the following in an annual report made by the president of a prominent gold mining company of Nova Scotia, viz: "The shoes and dies of Chrome Steel made by the Chrome Steel Works of Brooklyn, N. Y. have done admirable service, being replaced only after crushing 3,300 tons of quartz ore. From data of other gold mills at hand, this would seem to show a remarkable capacity for work, and not either on account of the softness of the ore, for on the other hand, the quartz is fairly hard and sharp."

A combination of welded Chrome Steel and iron 5-ply plate is another popular form in which Chrome Steel is furnished. These plates have been used for years past in the construction of safes and vaults of the largest financial institutions throughout the country. They are absolutely burglar-proof, for no tool, no matter how finely made and tempered, can cut, drill or saw them. They are composed of alternate layers of Chrome Steel and iron welded together.

Every one interested in the economic use of castings and the construction of burglar-proof work, should investigate the merits of Chrome Steel products if they have not already had their attention drawn to this really wonderful material.

CHROME STEEL WORKS,
BROOKLYN, N. Y.

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ALSEN'S PORTLAND CEMENT

is the strongest and most serviceable Cement made, and will permit the admixture of a larger amount of sand or gravel with less loss of strength than any other brand; it is therefore the most economical. It is the finest ground cement made, and has the largest bulk to the barrel.

The following test, made in actual work, by Col. D. C. Houston, Corps of Engineers, U. S. A., at the sea wall around Governor's Island, New York Harbor, has never been equalled by any other cement. It is as follows: Tensile strength per square inch, one day, 384 pounds; seven days, 600 pounds; thirty days, 818 pounds.

For Sidewalks it gives the best color, and the most endurable wearing surface. Most of the prominent Railroad Bridges and the large Office Buildings of the country stand upon a foundation of concrete made of ALSEN'S CEMENT.

Alsen's Portland Cement Works, New York Office, 143 Liberty Street.

WHY DO SHINGLES BECOME THIN?

A curious fact has been brought out by recent investigation. It has long been known by entomologists that wasps and hornets obtain paper for their nests from the exposed woodwork of houses to a very large extent. This any one may observe by watching the sunny side of a shingled house in early spring. But only recently has the full amount of these ravages been discovered. A shingle which had been partly dipped in Creosote was left on the ground for two years. At the end of that time the part which was not protected by the Creosote was cut into to the extent of a good fraction of an inch, the rest being untouched. This shows that we must attribute the thinning of old shingles not to wear or attrition alone, but chiefly to the inroads of these insects. It shows Creosote to be as good a protection against them as against decay and mildew.

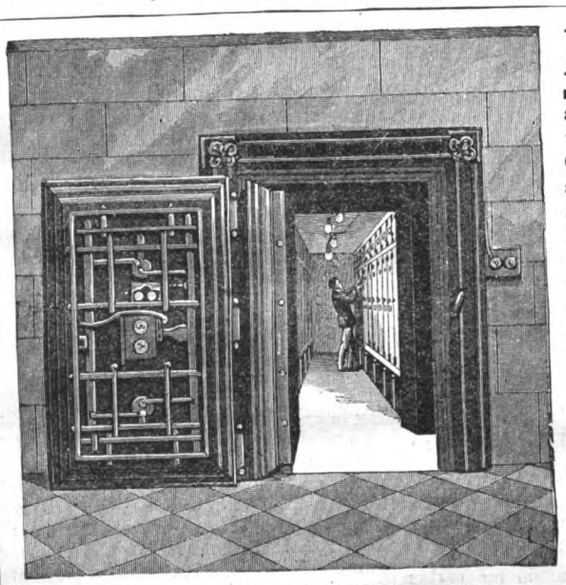
Brooks, Shoobridge & Co.

7 Bowling Green, New York. ENGLISH PORTLAND CEMENT

Detailed drawings furnished without charge, on application, to prevent mistakes in building

Avoid liability to Accident, Injury and Damages by having Level Passage in Vault Vestibule

Comfort and convenience promoted without interfering in the least with the security



LEVEL ENTRANCES into and out of Burglar, Fireproof and Cold-storage Vaults, with movable or fixed sills and movable floors, to prevent stumbling, without impairing security. Recommended by leading Architects, Civil and Mechanical Engineers of the highest repute, Engineers and Designers of Vaults, leading Vault Builders, the United States Commission on Safe and Vault Construction, the Director of the Mint, the Treasurer and Assistant Treasurer of the United States, the present Supervising and the ex-Supervising Architects of the Treasury Department, the Franklin Institute of Science of Philadelphia (which awarded the John Scott Legacy Premium and Medal), and Financial Institutions of New York, Philadelphia, Brooklyn, Boston, Providence, Baltimore, Washington, Pittsburgh, Wilkes-Barre, Cincinnati, Chicago, Camden, N. J., Lee, Worcester and New Bedford Mass., London, Eng., and other places, representing capital and surplus of over $1,000,000,000.

ROYALTY for each Vestibule for Burglar-proof Vault, $200; for Cold Storage or Fireproof Vaults, $25.

Architects, Engineers and Financial Companies are requested to specify Clark's Level Passages in all Vault Vestibules, which will then cost no more than the old style raised sills. The right to make or use these devices can be obtained only by License from

G. S. CLARK, 325 Chestnut St., Philadelphia, Pa.

SPECIAL REFERENCE IS MADE TO

Coleman Sellers, E. D., M. Inst. C. E., Consulting Engineer; Wilson Bros. & Co., Engineers and Architects; Wm. Sellers & Co., Engineers; J. M. Mossman, Vault Engineer and Expert; R. M. Patterson, C. E.; Blake Bank Lock Inspection Co.; W. H. Brown, Chief Engineer Penn. R. R. Co.; Henry R. Towne, M. E. and Pres't Yale & Towne Lock Co.; D. K. Miller, M. E. and Pres't Automatic Tumbler Lock Co.; Fairman Rogers, C. E.; F. S. Holmes, M. E.; G. W. & W. D. Hewitt, Architects, Philadelphia Bourse; J. C. Brooks, M. E. and President Southwark Machine Co; M. N. Forney, M. E. and Publisher of the *Railroad and Engineering Journal;* John T. Morris, M. E.; W. C. Gatzmer, C. and M. E. and Marine Architect; M. R. Muckle, Jr. & Co., M. Engineers; Jno. Birkinbine, M. E.; J. H. Linville, C. E.; Alex. P. Gest, C. E.; Jacob Naylor, M. E.; John V. Rice, Jr., M. E.; Richard M. Hunt, Architect, New York; J. H. Windrim, Architect and Director of Public Works, Philadelphia; Cabot, Everett & Mead, Boston; Baldwin & Pennington, Architects, Baltimore; Jas. G. Hill, Architect, Washington; W. Kauffman, Architect, Pittsburgh; The Fidelity Insurance, Trust and Safe Deposit Co.; The Provident Life & Trust Co.; The Philadelphia & Reading Terminal Co.; The Pennsylvania R. R. Co.; The Girard Life and Trust Co.; The Philadelphia Trust and Safe Deposit Co.; The Guarantee Trust and Safe Deposit Co.; Drexel & Co.; The Pennsylvania Co. for Insurance on Lives and Granting Annuities, *Philadelphia;* The Mercantile Safe Deposit Co.; Central R. R. Co. of N. J.; Lincoln Safe Deposit Co., *New York;* Franklin Safe Deposit Co., *Brooklyn;* Rhode Island Safe Deposit Co., *Providence, R. I;* The Fidelity and Deposit Co; The Drovers and Mechanics National Bank; The Mercantile Trust and Deposit Co., *Baltimore;* International Trust Co.; Security Safe Deposit Co.; Union Safe Deposit Vaults; Boston Safe Deposit and Trust Co., *Boston;* Lee National Bank; Merchants National Bank, *New Bedford, Mass.;* Haddonfield National Bank, N. J.; American Security and Trust Co., *Washington, D. C.;* and many others.

The only patents that allow Level Passages in Vault Vestibules having Fixed or Movable Sills

ALL OTHER DEVICES FOR THIS PURPOSE ARE INFRINGEMENTS.

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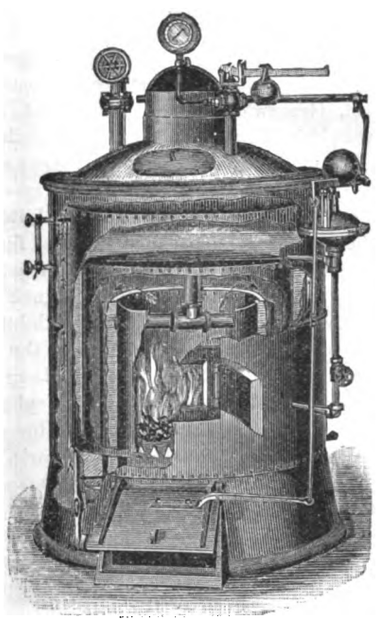
The American Architect and Building News

ADVERTISERS' TRADE SUPPLEMENT.

No. 143. SATURDAY, MAY 5, 1894. Volume XLIV. No. 958.

"PEERLESS" STEAM AND HOT-WATER HEATER.

The accompanying illustration shows a flange steel and iron boiler, equally adapted for either steam or hot-water heater. It is simple in construction, there are no parts to get out of repair and no tubes to clog, and it requires but little cleaning. It will generate steam quicker than any other boiler, requiring but ten minutes from the time of lighting the fires to raise and force steam to any point where steam is desired. It will thus be seen that it not only economizes time, but fuel as well. The reason for this is that there are no useless surroundings to warm up, the



The "Peerless."

heating power being applied directly to the steam-generating surfaces, thus gaining the benefit of every atom of heat power formed. The boiler proper is directly over the fire-box, and has extensions projecting downward and surrounding the fire-box. Across the top of the fire-box is arranged an inverted T-pipe whose horizontal portion communicates with the water-space of the fire-box, while its vertical portion extends into the boiler above. Short transverse-pipes connect the lower portion of the boiler extension with the adjacent parts of the water-space of the fire-box. It will be apparent that the water contained in the annular space of the fire-box will be quickly heated, and will readily pass or circulate to the boiler. The heat will pass downward, around the boiler extension, and thence upward over the top of the boiler to the chimney, thus practically surrounding the boiler and the water which it contains, thereby quickly generating steam. The Boiler is portable and can be set in place ready for use in two hours' time. It will burn either anthracite or bituminous coal or coke. It is constructed of the best flange steel 60,000 tensile strain and thoroughly tested before leaving the shop to 150 pounds. The prices are placed so low that it will successfully compete with any boiler now in the market. This Boiler is the most economical, having the most direct and effective heating-surface, will burn any kind of fuel, is simple in construction, made of the best material, is tubeless, thus having no flues to clog up, and it costs the least money. This heater was long and favorably known as the "Schimpf" boiler, but the entire property and plant having been purchased by a syndicate of influential men, it has been deemed best to change the name to "Peerless," and the heater will be known, hereafter, by that name. For catalogue, testimonials, terms, prices, etc., address,

GEO. H. BELL & CO.,
Sole Agents for the United States.
114 and 116 Nassau Street and 41 Dey Street,
New York, N. Y.

THE GOETZ BOX ANCHOR.

It is a fact that a greater number of cities than usual have adopted new building laws, and in nearly all of them there has been made special mention about the method by which joist and timbers should be tied to the walls. In these later ordinances there is a provision which requires that all joists must be anchored to the brick walls by some approved method, so that the falling joists will

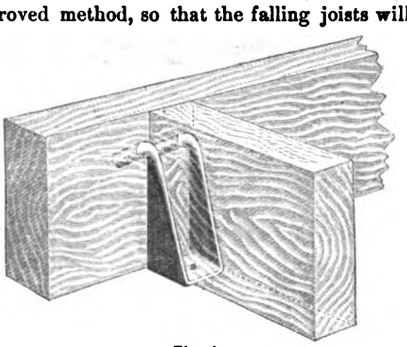


Fig. 4.

release themselves from their anchorage without damage to the wall.

Insurance companies have also noticed the importance of a provision of this kind, and in the New Universal Schedule for rating risks, they allow a reduction in rates if the joists are anchored to the walls by means of metallic anchor-boxes.

The Goetz Box Anchor comes nearest of any in filling the requirement of both building laws and insurance companies. The method consists of a simple cast-iron box of dove-tail form, built in the wall, into which every fifth joist is notched over a lug in the bottom of the box, as shown in cut No. 1.

For large timbers a plate is added to the bottom and air-spaces to the sides; this gives ample air around the wood and positively prevents dry-rot, so liable to occur in large

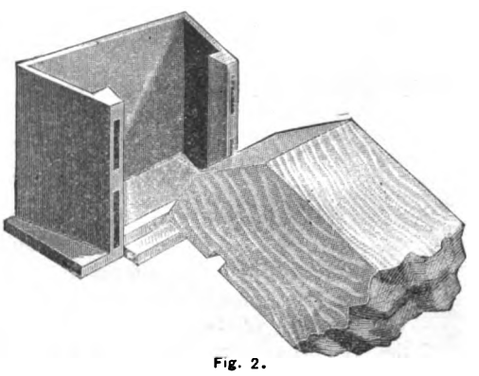


Fig. 2.

timber, and because of being used in an unseasoned condition.

Figure 3 illustrates the Goetz Post Cap. It costs no more than any metal cap, the advantages are ease of fitting, a continuous post from cellar to roof, all tied together, and still any horizontal beam in falling will release itself without damage to the other parts. The cap is of cast iron and the material is arranged to secure the greatest possible strength.

The old system of mortising joists when trimming around flues, stairways, and hatch-

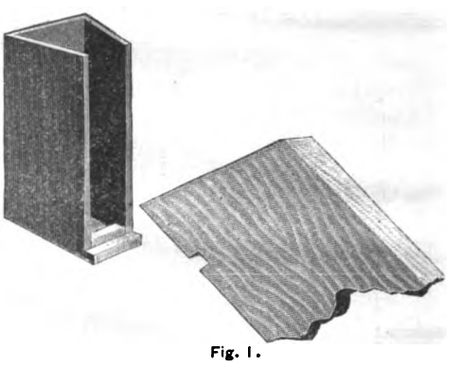


Fig. 1.

ways is fast disappearing, for with the new Goetz Joist Hanger shown in Figure 4, a stronger and better job is done. The cost of the hanger is about the same as the time consumed in making the old mortise, and assembling the parts for the new hanger is easily employed by boring two holes with no fitting to be done.

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The Company and its agents have supplied 400 buildings to date with these new devices. They are decided improvements over the old methods, and owners will be glad to see that architects adopt these in their building. The Company has located agencies in nearly every large city, so that consumers can get bids and the articles at home without trouble or loss of time, and in addition save the freights. Send to home of the Company for illustrated catalogue.

GOETZ BOX ANCHOR CO.,
No. 72 State Street, New Albany, Ind.

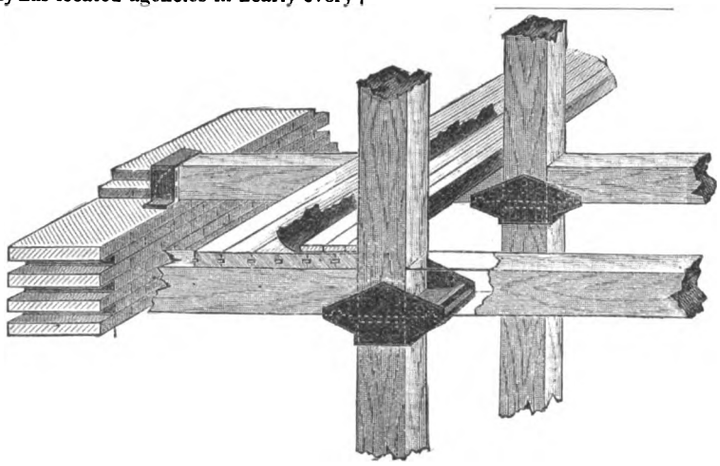


Fig. 3.

MEETING OF THE STOCKHOLDERS OF THE JOS. DIXON CRUCIBLE CO.

As an evidence that times are not so deplorable as they are said to be, was the satisfactory meeting of the stockholders of the Joseph Dixon Crucible Company, held at their fine offices in Jersey City, N. J., April 16. Out of 7,345 shares 7,215 votes were cast for the same Board of Managers that has conducted the affairs of the company through its years of prosperity. The vote was the largest ever cast and it was a decided compliment to the members of the Board, as were also the remarks of some of the largest stockholders. The Board consists of E. F. C. Young, John A. Walker, Daniel T. Hoag, Richard Butler, William Murray, Joseph D. Bedle, Jerome D. Gillett.

In the organization of the Board Mr. E. F. C. Young was elected President, John A. Walker Vice-President and Treasurer, George E. Long, Secretary.

The Dixon Company was founded by Joseph Dixon in 1827, and organized as a stock company in 1868.

Its manufactures are graphite products of all kinds, consisting of plumbago crucibles for melting gold, silver, brass, etc., blacklead retorts, stove polish, graphite for lubricating, electrotypers' graphite, graphite lead-pencils, graphite paint, and graphite prepared in hundreds of ways for as many different uses.

Graphite is one of the principal forms of carbon. It is not affected by heat or cold, acids or alkalies, and is, therefore, one of the most useful materials known to modern industry when rightly prepared.

The Joseph Dixon Crucible Co., Jersey City, N. J., are putting a cycle-chain graphite on the market, which for purity of graphite and usefulness is vastly superior, it is claimed, to anything of the kind heretofore prepared. The graphite is not only of the choicest stock, but is ground to an impalpable powder, and then reground with a high grade of lubricating oil. This material, when applied to the chain of a bicycle, penetrates to the bearings and thoroughly lubricates and protects them from wear and rust. The Dixon Company will shortly put the same material on the market in solid form, for the convenience of wheel-men who wish to carry it in their tool bags.

JOSEPH DIXON CRUCIBLE CO.,
Jersey City, N. J.

PRESSED AND ENAMELLED BRICK.

Tiffany Pressed Brick Co. has been awarded the large contract for furnishing enamelled brick (in competition with the best English), to be used in construction of the new Marquette Office Building, now being erected at Adams and Dearborn Streets in Chicago. As is well known, most of the enamel brick hitherto used in this vicinity have been imported.

These bricks are made of the standard English size (3′ x 9′ x 4½′) and include stretchers, quoins, soap, radius, and round-end bricks; and are made in white, ivory, cream, buff, and other colors.

Architects are at liberty to subject our enamelled bricks to the most severe tests, on equal terms with the best imported bricks.

The advantage which the "Tiffany" possesses over companies distantly located, in its ability to deal with architects, contractors and owners without loss of time, will, we think, be appreciated.

It should be noted, that while 7½′ brick of the ordinary (American) size are required per square foot of wall, only 5½′ are needed in the English size which we have adopted — a difference of about 33⅓ per cent in favor of the English size, which, with the saving in laying and materials, makes the larger brick as cheap to the contractor, at say $110 per M., as the smaller at $75 per M.

The comparative cost laid in wall of terra-cotta, pressed brick, or enamelled brick, is about as follows, at current prices in Chicago:

Terra-cotta (plain)..	$1.00	to	$1.25	per	square foot.
Enamelled brick....	.65 "		.75 "	"	"
Pressed brick.....	.30 "		.40 "	"	"

The use of enamelled brick is rapidly increasing in railway stations, alley walls, courts, light-shafts, natatoriums, elevator-shafts, subways, stable interiors, kitchens, laundries, markets, etc. — in fact, wherever light and cleanliness are essential, while in some of the European cities, it is coming into use for fronts as well, on account of its superior durability and cleanliness, and its unchanging color.

We wish it to be specially noted that our bricks are not glazed, but are thoroughly enamelled, the enamel forming a complete and inseparable union with the bricks, which will stand for inside or outside work in any climate.

It may be mentioned incidentally, that the "Tiffany" received two awards at the World's Columbian Exposition, for pressed and ornamental brick, before its enamelled brick had been perfected or exhibited.

The fine display has since, at the request of the officers of the new Columbian Museum, of Chicago, been presented to that institution, where it will hereafter be maintained.

The quality of all goods manufactured by this Company is guaranteed to be equal to the best.

We expect each year to increase the variety of our output and the number of our friends and customers.

Among the most prominent buildings in Chicago, faced with the Tiffany Pressed Brick, of red, brown, and light shades, are the Metropole, Hyde Park and Plaza Hotels, Sheridan and Hyde Park Clubs, Grand Central Passenger Station.

And following office-buildings, viz:

Western Bank Co., Ashland, Teutonic, Ellsworth, Dexter, Monadnock (new part), etc.

Samples of the "Tiffany" product are kept at the Institute of Building Arts, Nos. 63 and 65 Washington Street, Chicago, for the convenience of architects and others.

Our display can also be seen at the new Columbian Museum in Chicago.

J. VAN INWAGEN, *President*,
Chicago, Ill.

SEYSSEL ASPHALTE.

The use of Seyssel Asphalte for floors of schools is becoming very general. We have this year laid the entire first floor of the New York City schools on West Forty-sixth Street and the Fifty-fifth Street Annex, and are now engaged in similar work in the large schools now being erected on Washington and Carlisle Streets and West Fourteenth Street. We are also laying floors at the Havemeyer School, Greenwich, Conn. The latest improvement in New York City school buildings is that just started at Edgecombe Avenue and One Hundred and Fortieth Street, the specifications for which call for a Seyssel Rock Asphalte roof in addition to the first floor. We have been awarded the contract for the asphalte work in the Berwind residence on Fifth Avenue, a model of which was exhibited by the architect, Mr. M. C. Mellen, at the recent exhibition of the Architectural League. We are now exhibiting views of Rock Asphalt streets and sidewalks as laid in the Rue des Louvre and at the Central Market, Paris, at the Exhibition of Architectural Drawings and Designs at the Art Galleries, Brooklyn.

T. HUGH BOORMAN, *Manager*.
New York Mastic Works.

EAVE TROUGH HANGERS.

Gutters formed on the roof are unsightly and dangerous in preventing the snow from sliding off as it falls, causing it to heap up, and by the action of freezing and thawing (the metal gutter being colder than the shingles) it will cause the water to back up beyond the highest point of the metal, till it runs over, causing leaks, which are usually charged to the tinner not running the metal high enough.

Such gutters stop the snow from sliding down, and in thawing and freezing, gradually sliding over the gutter, often hanging for days and weeks, cause constant dripping and danger of the whole mass coming down in such weight as to break the slates on the porch roofs and make it dangerous to life below.

Concealed gutters, formed in the cornice, are very expensive, especially in fine modern homes, which frequently cost hundreds of

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dollars, all of which could be saved to the owners and applied to better use. They are subject to some of the same annoyances as in gutters formed on top of the roof, by freezing up till the water backs up and runs over the inside edge of the metal, or broken joints caused by contraction and expansion, and other defects due to the usual imperfect pitch of the gutter, causing the water and rubbish to stand in the gutter till it is rusted through.

Gutters should not be hung from the shingles with straps, wires or cross-bar hangers in any form whatever, or anything used that spans the gutter in a way to obstruct the flow of rubbish, or prevent it from being cleaned out when choked, or to allow it to expand when frozen shut with ice.

Hangers of this class, suspended from the shingles, are not only unsightly but cause the shingles to rot under the straps and soon rattle loose by the wind, or twist out of shape by snow and ice sliding over the outer edge of the gutter and choke up with rubbish catching on the cross-bars, and stems sticking down in the gutter.

Outside hanging troughs, if properly hung, not only pay for themselves in additional width they add to the projection, but do away with a great many annoyances and menaces, as well as expense, leaving the roof free of all unsightly obstructions. No dangerous snow-slides occur. On modern roofs, steep as they should be to look well, the snow will slide off as it falls, giving it no chance to freeze, needing no snow-guards, which are generally as unsightly as a gutter on the roof.

The only true principle of hanging gutters on the eaves of buildings is the usual half-round gutter hung on the outside, made in long lengths of heavy plate, galvanized or leaded, with slip-joints, hung only with supporting hangers from below, space close equal distance apart to give the trough a neat, strong, panelled appearance, leaving it entirely clear inside or on top, which will allow it to expand when filled with ice, and to wash out clean, leaving the roof entirely free of fasteners above the trough.

Troughs should be hung with fasteners of sufficient strength to prevent sagging or twisting out of shape by the flow of ice and snow from the roof above, and in such manner as to allow the trough to be easily changed to a proper pitch at any time, if necessary to drain out clear, or remove it when necessary for repair.

The fasteners should be suited to all styles of finish on the eaves. The best fasteners are those concealed under the shingles, or to the sides of the rafters, or on the front face of the eave behind the gutters, as may be required.

The Berger Hangers are made of great strength, and to embrace the trough from below, leaving it clean inside, so the trough can be swept out or kept clean. The fasteners or shanks are made in several styles, to fasten to the eaves, more or less concealed, either by slipping them under the shingles or by nailing them to the sides of the rafters, or by nailing them on the mouldings behind the gutters.

Special kinds are made for steep roofs, which can be bent to suit the variation, also hinged to suit any pitch of the roof.

This Hanger is made in two pieces, a shank fastening to the eave, and a circle embracing the trough. It is so simple in its construction that it can be made cheap and put up quick without the use of a line.

The adjusting principle is both novel and ingenious, using a common stove bolt through holes every half-inch apart in the shank, and five-eighths inch apart in the circle, by which the fall is regulated every eighth, quarter or half-inch fall, doing away with keys, notches, teeth, set-screws or cams.

For inducement to use the Berger Favorite Hangers a certain foreman agreed with his new employer to hang a gutter with the Berger Hanger and walk in it.

In another instance the tower and dormer windows were painted with no other means of support than a common scantling laid in the gutter hung with the Berger Hanger.

Another where a gutter was pitched to the wrong end. All the tinner had to do was to change the bolts to other holes in the shank and make a new outlet at the other end, showing how easily a gutter can be corrected to a perfect pitch.

Note, the time is coming when all suspended cross-bar styles of hangers, wires and straps of every sort will be a thing of the past, as well as gutters concealed or formed on top of the roof, when ten cars of finished, crated gutters will be sold to one now, all hung with the Berger Standard Hangers.

BERGER BROS.
237 ARCH STREET, PHILADELPHIA, PA.

GALVANIZED STEEL SHINGLES.

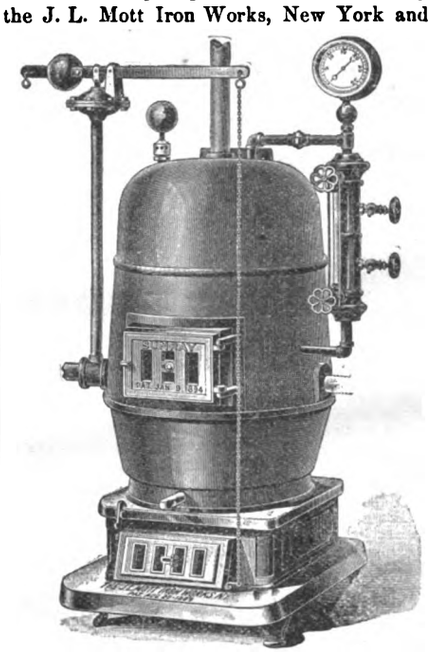
IT will be noticed that our advertisement refers to the fact that we are now prepared to offer *galvanized steel shingles* at low prices, and are in a position to execute orders promptly.

Heretofore we have made our goods of *only tin plate* or *copper*, but recognizing the fact that there were some people who preferred galvanized goods, we placed ourselves in a position to fill their wants.

CORTRIGHT METAL ROOFING CO.,
PHILADELPHIA, PA.

MOTT'S "SUNRAY" STEAM BOILER.

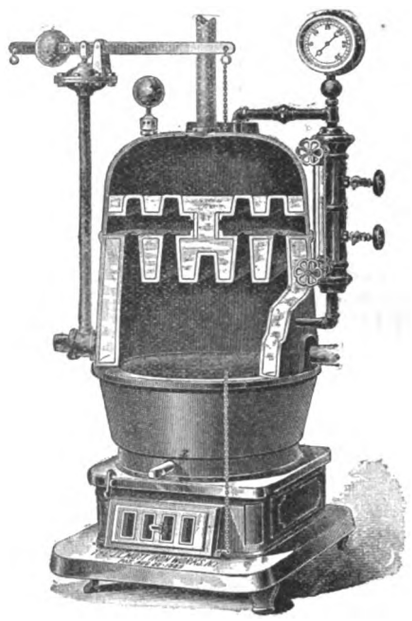
THE accompanying cut illustrates a new Steam Heater just placed on the market by the J. L. Mott Iron Works, New York and



Chicago. The Heater it designed for small residence work and for furnishing steam for coffee-rooms, steam-kettles, carving-tables, or any other purpose requiring a moderate supply of steam at a low pressure.

It is claimed that technical tests of this Heater show a very high rate of economy and efficiency. It has an ample fire-chamber and the heating-surface is brought in direct contact with the fire, thus making a quick and powerful steamer. Figure 1 gives the external appearance of the Heater, and Figure 2 is a sectional cut showing arrangement of fire-surfaces, water-line and steam-chamber.

It will be seen from the illustrations that no steam or water joints are left for the fitter to make, as the generating part of the Heater is all put together before shipment; also, that no packed or washer joints are used in its construction. It is easily handled and



can be taken in at any ordinary door or window. It is claimed by the makers that this Heater can be set up ready for piping in one-half hour after it has been unloaded at the building.

This Heater is made in five sizes, capable of supplying from 150 to 400 square feet of heating surface, or the equivalent in any other service it may be used for.

J. L. MOTT IRON WORKS,
NEW YORK AND CHICAGO.

GORTON HOT-WATER BOILERS IN TWIN CONNECTION.

AN interesting installation of house-heating boilers are two No. 25 Gorton Hot-water Boilers set in twin connection which have been used during the past winter for heating the Black & Baird office-building, Pittsburgh, Pa. The apparatus was put in by McGuiness, Smith & Co., of that city, and has given the utmost satisfaction.

GORTON & LIDGERWOOD CO.,
NEW YORK.

NOTES.

MESSRS. N. & G. TAYLOR CO., Philadelphia, have just supplied their Old Style brand of extra heavily-coated roofing tin for covering the State Library and Executive Building at Harrisburg, Penna. The architect, Mr. John T. Windrim of Philadelphia, *exacted this brand* — the finest made — over all competitors, on account of its acknowledged quality and durability. The same brand, their Old Style, was also used in the House of Representatives.

The genuine Old Style, as our readers are no doubt aware, is made by the Palm Oil Process. This method, in addition to its extra heavy coating, gives the plate its great durability. The sheets do not come in contact with any acid flux, rolls, machinery, etc., nor are any artificial means whatever employed to secure an appearance on the sheets at the expense of the quality.

The Old Style is made in open pots, the sheets dipped entirely by hand and by the slowest and most expensive process known, whereas the imitations of this brand are made

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ALSEN'S PORTLAND CEMENT

is the strongest and most serviceable Cement made, and will permit the admixture of a larger amount of sand or gravel with less loss of strength than any other brand; it is therefore the most economical. It is the finest ground cement made, and has the largest bulk to the barrel.

The following test, made in actual work, by Col. D. C. Houston, Corps of Engineers, U. S. A., at the sea wall around Governor's Island, New York Harbor, has never been equalled by any other cement. It is as follows: Tensile strength per square inch, one day, 384 pounds; seven days, 600 pounds; thirty days, 818 pounds.

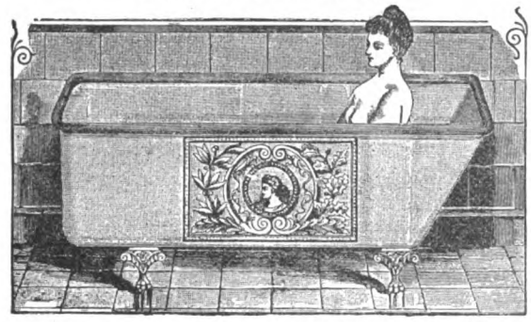
For Sidewalks it gives the best color, and the most endurable wearing surface. Most of the prominent Railroad Bridges and the large Office Buildings of the country stand upon a foundation of concrete made of ALSEN'S CEMENT.

Alsen's Portland Cement Works, New York Office, 143 Liberty Street.

THE BISCHOFF SHEET STEEL BATH-TUB.

ENAMELLED.

THE CHEAPEST AND BEST SANITARY BATH ON THE MARKET.



SEND FOR OUR ILLUSTRATED CATALOGUE AND PRICES.

FRED. F. BISCHOFF & CO., 24-26 West Lake St., CHICAGO.

in patent pots by the cheap quick Acid Flux Process. It is folly even to attempt a comparison between these two processes.

Messrs. Taylor report an excellent and steady demand for all their product, the quality of which seems to be generally recognized. Their Works at Philadelphia are fully employed, not only on ternes but also on bright tinplates of all kinds.

N. & G. TAYLOR CO.,
PHILADELPHIA, PA.

The New York office of the Huyett & Smith Manufacturing Company of Detroit has been moved from 107 Liberty Street to 26 Cortlandt Street.

The Government Authorities at the United States Navy Yard, Washington, D. C., after subjecting Chrome Steel to severe tests, say in a letter to the Chrome Steel Works, Brooklyn, N. Y., sole manufacturers: "It will do from three to four times more work in all the various kinds of tools, than carbon steel will." This is a quality of much value to makers of fine tools, and worthy of remembrance.

The Gorton & Lidgerwood Company, 96 Liberty Street, New York City, manufacturers of the Gorton house-heating boilers, will shortly issue a new edition of their book, "*Modern House Heating*," which bids fair to be in general demand. The work typographically will be a work of art, and will contain a fund of practical information as to the best manner in which to heat dwellings and other structures efficiently and economically.

BUILDING INTELLIGENCE.

Reported for the American Architect & Building News.

ALTERATIONS.

Brooklyn, N. Y. — *Grove St., Nos.* 185-195, 6 three-st'y brick flats, tin roof; damage by fire to be repaired; cost, $3,200; owner, Virginia A. Keene, 781 Munroe St.; architect, John Anderson, Pacific St.

BUILDING INTELLIGENCE.

(*Alterations Continued.*)

Pacific St., Nos. 118-120, 2 three-st'y brick tenements, tin roofs; internal alterations to be made; total cost, $5,000; owner, F. C. Lawrence, Jr., Bay Shore, L. I.; architect, G. F. Pelham, 1481 Broadway, New York City.

Washington St., e s, 125′ n Concord St., three-st'y brick dwell., tin roof; to be raised one story, four-st'y brick extension, tin roof, to be added, and internal and other alterations to be made; cost, $8,000; owner, H. P. De Graaf, One Hundred and Twenty-fifth St., and Fifth Ave., New York City; architect, G. M. Walgrove, 99 Nassau St., New York City.

First St., n w cor. Denton Pl., 6 five-st'y brick stores and dwells., tin roofs; buildings put in safe condition; cost, $7,000; owner, Henry E. Fox, 80 Broadway, New York City; architect, A. F. Leicht, 60-62 Liberty St., New York City.

CHURCHES.

Brooklyn, N. Y. — *Ralph St.*, s s, 410′ w Central Ave., two-st'y frame church and Sunday-school, tin roof; cost, about $10,000; owner, German Reformed Church of Jesus, 11 Stanhope St.; architect, F. J. Lessing, 412 Evergreen Ave.

HOUSES.

Brooklyn, N. Y. — *Union Ave.*, e s, n Richardson St., four-st'y brick dwell., tin roof; cost, $6,000; owner, G. Defeine, Union Ave. and Richardson St.; architect, Henry Vollweiler, 483 Hart St.

Van Siclen Ave., No. 33, two-st'y brick dwell., tin roof; cost, $4,600; owner, O. Heinbold, 35 Van Siclen Ave.; architect, Frank Holmberg, 1169 Broadway.

Park Pl., s s, 466′ e Underhill Ave., 6 two-st'y brick dwells., tin roofs; cost, $25,000; owner, Wm. H. Reynolds, Fulton and Washington Sts.; architects, Dahlander & Hedman, Arbuckle Building.

Decatur St., s s, 160′ e Howard Ave., 2 two-st'y brick dwells., gravel roofs; cost, $4,000 each; owner and builder, R. D. Robbins, 189 Ralph Ave.; architect, Henry B. Hill, 193 Ralph Ave.

Park Pl., s s, 375′ e Underhill Ave., 5 two-and-one-half-st'y brick dwells., tin roofs; cost, $25,000; owner, Wm. H. Reynolds, Fulton and Washington Sts.; architects, Dahlander & Hedman, Arbuckle Building.

Vernon Ave., s s, 136′ w Sumner Ave., three-st'y brick dwell., tin roof; cost, $10,000; owner and builder, B. J. Schaffner, 1124 Myrtle Ave.; architect, Frank Holmberg, 1169 Broadway.

Putnam Ave., n s, 100′ w Howard Ave., 2 three-st'y brick dwells., tin roofs; cost, $4,000 each; owners and builders, J. W. Lamb & Son, 71 Cornelia St.; architect, A. J. Lamb, 75 Cornelia St.

Hewes St., n e cor. Bedford Ave., 3 four-st'y brick dwells., tin roofs; cost, $7,000 each; owners, architects and builders, Allan Bros. & Co., 371 Fulton St.

Decatur St., s s, 18′ e Hopkinson Ave., 4 two-st'y brick dwells., tin roofs; total cost, $14,000; owner and builder, Robt. L. Moores, Decatur St. and Broadway; architect, Ernest Dennis, 115 Himrod St.

Decatur St., s e cor. Hopkinson Ave., two-st'y brick dwell., tin roof; cost, $4,000; owner and builder, R. L. Moores, Decatur St. and Broadway; architect, Ernest Dennis, 115 Himrod St.

Union St., n s, 80′ e Sixth Ave., 6 four-st'y brick dwells., tin roofs; cost, $7,000 each; owner, Louis Bonert, on premises; architect, Robt. Diton, 219 Montague St.

Heron St., s s, 125′ e Oakland St., three-st'y frame dwell., gravel roof; cost, $4,000; owner and builder, W. P. McGarry, 110 Calyer St.; architect, P. Tillion, 209 Manhattan Ave.

BUILDING INTELLIGENCE.

(*Houses Continued.*)

Atkins Ave., w s, 100′ n Eastern Parkway, 10 two-st'y frame dwells., tin roofs; cost, $1,800 each; owners, architects and builders, 4241 Fulton St.

Oakland St., w s, 125′ n Meserole Ave., 2 three-st'y frame dwells., gravel roofs; cost, $4,500 each; owner, David Quinlan, 64 Diamond St.; architect, P. Tillion, 209 Manhattan Ave.

Bleeker St., s s, 250′ e Hamburg Ave., 2 three-st'y frame dwells., tin roofs; cost, $4,500 each; owner and builder, Otto Lehman, 969 Broadway; architect, Geo. Hillenbrand, 218 Bleeker St.

Jefferson Ave., s s, 80′ w Evergreen Ave., three-st'y frame dwell., tin roof; cost, $3,000; owner and builder, G. D. Meyeau, 608 Evergreen Ave.; architect, W. B. Wills, 504 Hart St.

Dean St., s s, 365′ w Nostrand Ave., four-st'y and 2 three-st'y brick dwells., tin roofs; total cost, $20,000; owner, C. L. Gammis, 138 River St.; architect, J. D. McAuliffe.

Navy St., Nos. 222-223, 2 five-st'y brick dwells., tin roofs; cost, $10,000 each; owner, Frank H. Davies, 111 Broadway, New York City; architects and builders, Davies & Co., 111 Broadway, New York City.

Waverly Ave., e s, 404′ 6″ s Fulton St., 3 four-st'y brick dwells., gravel roofs; cost, $5,000 each; owner, Wm. Sullivan, 102 Thornton St.

Bergen St., n s, 80′ e Franklin Ave., two-and-one-half-st'y brick dwell., tin roof; cost, $3,000; owners and builders, Leonard Bros., 737 Bergen St.; architect, W. M. Coots, 189 Montague St.

Willow St., e s, 50′ n Cranberry St., five-st'y brick dwell., tin roof; cost, $10,000; owner, architect and builder, Geo. W. Campbell, 779 Greene Ave.

Bleeker St., s s, 200′ e Hamburg Ave., 6 three-st'y frame dwells., tin roofs; cost, $4,500 each; owner and builder, Otto Lehman, 969 Broadway; architect, Geo. Hillenbrand, 218 Bleeker St.

Linwood St., w s, 25′ n Sutter Ave., 4 two-st'y frame dwells., tin roofs; cost, $1,500 each; owner and builder, Fred Eiermann, 259 Hendricks St.

Palmetto St., n s, 300′ e Knickerbocker Ave., three-st'y frame dwell., tin roof; cost, $4,200; owner, A. Diehm, 1371 Greene Ave.; architect, Geo. Hillenbrand, 218 Bleeker St.

St. Mark's Ave., n s, 150′ w Buffalo Ave., 2 three-st'y frame dwells., tin roofs; total cost, $11,000; owner, J. Scholl, 1297 St. Mark's Ave.; architect, E. Dennis, 115 Himrod St.

Forty-fifth St., n s, 100′ e Fifth Ave., 5 two-st'y frame dwells., tin roofs; cost, $2,500 each; owner and architect, James Hart, 183 Forty-third St.

Somerville, Mass. — *Chestnut St.*, cor. Poplar St., dwell.; owner, John Lyons; builder, John McGirr.

Orchard St., cor. Meacham St., dwell.; owners and builders, Lea & Ellis.

Snow Terrace, 2 dwells.; owner, Annie McGrath; builder, John K. McGrath.

Winslow Ave., near Grove St., dwell.; owner and builder, A. R. Lewis.

Winthrop, Mass. — Dwell. for Wm. McNunn; architect, W. J. Paine, Boston.

SCHOOL-HOUSES.

Southboro, Mass. — Brick high-school building is to be built in this town; cost, $25,000; architect, Chas. E. Park, Boston.

STABLES.

Boston, Mass. — *Canal St.*, cor. Friend St., four-st'y brick stable, flat roof, 56′ x 145′; cost, $150,000; owners, American Express Co.; builders, Gooch & Pray; architects, Winslow & Witherell.

Brooklyn, N. Y. — *Bedford Ave.*, s w cor. Bergen St., three-st'y brick stable, gravel roof; cost, $20,000; owners, Pearce & Smith, 460 De Kalb Ave.; architect, J. G. Glover, 186 Remsen St.

STORES.

Boston, Mass. — *Harrison Ave., Nos.* 7-11, five-st'y brick and stone store and mercantile-building, flat roof, 60′ x 80′; architect, Jos. Lafield, 12 Pearl St.; contract let.

Brooklyn, N. Y. — *Third Ave.*, e s, 20′ s Fifty-third St., four-st'y brick store and dwell., tin roof; cost, $6,000; owner and builder, S. C. Halstead, 381 Second St.; architect, Thos. Bennett, 181 Fifty-seventh St.

Morgan Ave., s e cor. Grattan St., four-st'y frame store and dwell., tin roof; cost, $7,250; owner, Lorenz Ebert, Thames and Bogart Sts.; architect, H. E. Funk, 200 Knickerbocker Ave.

Knickerbocker Ave., w s, 54′ 4″ n Harrison Pl., 2 three-st'y frame stores and dwells., tin roofs; cost, $4,500 each; owners and builders, Werner & Weidner, 234 Irving Ave.; architect, Geo. Hillenbrand, 218 Bleeker St.

New York Ave., e s, 25′ s Malbon St., four-st'y frame store and dwell., gravel roof; cost, $4,800; owner, R. Spranso, Malbon St. and New York Ave.; architect, F. S. Sihrson, 69 Clifton St.

TENEMENT-HOUSES.

Boston, Mass. — *Meridian St.*, near Monmouth St., Ward 1, three-st'y frame tenement, flat roof, 22′ x 53′ 9″; owner, S. Goldenburg; builder, W. Goodwin

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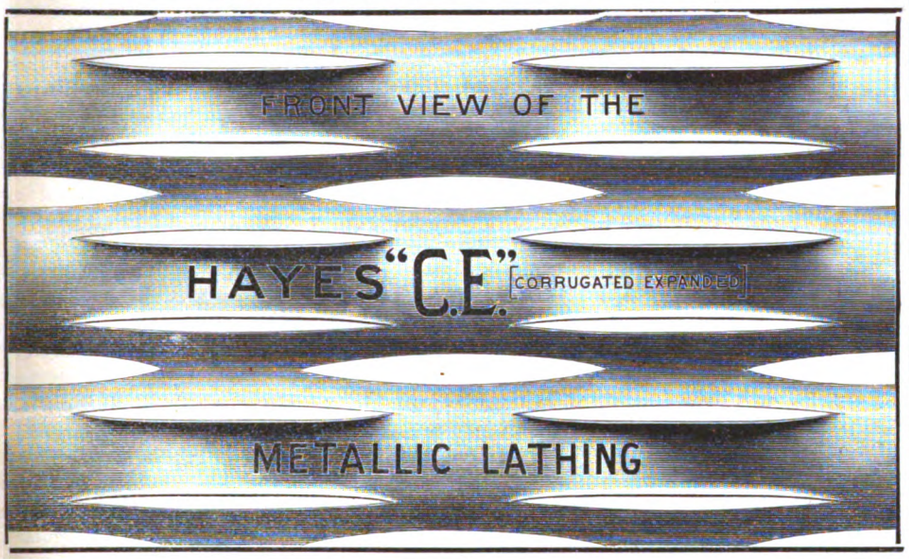
AMERICAN ARCHITECT AND BUILDING NEWS

ADVERTISERS' TRADE SUPPLEMENT.

No. 144. SATURDAY, JUNE 2, 1894 VOLUME XLIV. No. 962.

METALLIC LATHING.

MR. GEORGE HAYES, whose inventions in connection with Architectural Engineering are well known and extensively adopted in nearly every civilized country, has again contributed to the art by the invention of additional, new and highly practical devices in metallic lathing, to be known as the Hayes "C. E." (corrugated expanded) Lathing, which has been patented in the United States, Canada, England, France, Germany, Austria, Italy, Belgium, Spain and Russia. He takes a sheet-metal blank say 30″ x 96″ corrugates the same and otherwise forces it out of plane, after making at prescribed intervals over its entire surface certain slits or openings which, in the process of manufacture are expanded, the outlines thereof being double arc lines, one on each side of the chord forming lanceolated openings, their axes representing the true length of the metal employed. These apertures are arranged longitudinally, occurring in the depressions while upon the elevations are formed a series of arched loops having a concave crown; the depressions and elevations being and forming the corrugated surface, while the loops give the appearance of transverse corrugations. Strange as it may appear and in seeming conflict with the inflexible law of geometry, this divergence from the plane of the sheet and from the axis of the openings detract not one tittle from the original flat sheet, either in its length, width or thickness, producing a sheet of finished lathing 30″ x 96″. A paradox indeed,— for to corrugate or to depart from a plane or any divergence from an axis naturally means a contraction, but not so with this production. To the mechanica mind, when presented in its entirety it becomes easy of reconciliation; every divergence from the plane transversely and longitudinally is compensated for locally by the peculiar shape of the loops and depressions, which form the web of metal produced by the expansion of the apertures. The sheet in the operation of being slitted or apertured at regular intervals over its surface for the time being becomes weakened, but in the further process of manufacture it regains its primary and acquires its new strength and rigidity as it assumes its corrugated form; in short, Mr. Hayes has invented the art of corrugating expandedly.

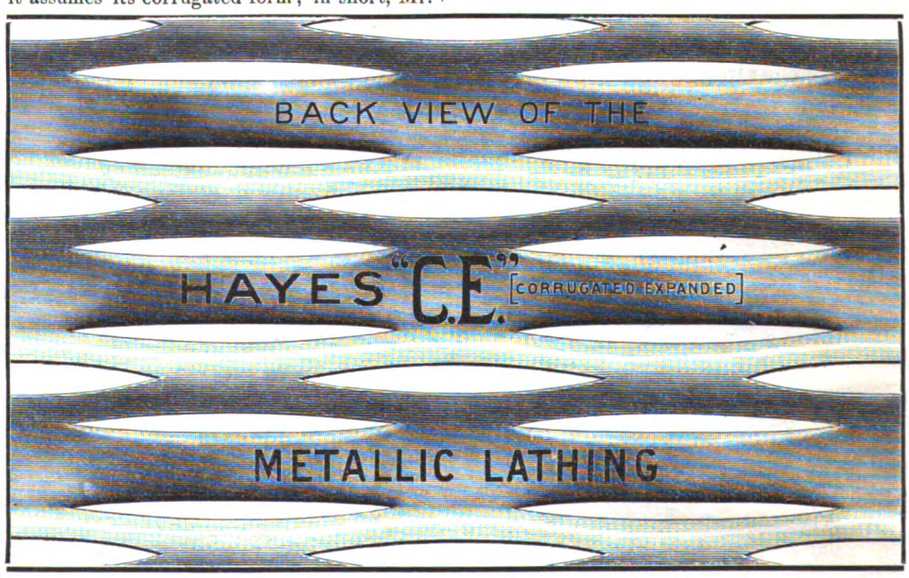


A sheet of metal lathing so corrugated partakes of all the strength and rigidity of an ordinary corrugated sheet, and when reinforced with plastic material becomes as substantial as a slab of stone.

Mr. Hayes does not confine himself to one particular pattern or form of lathing but has contrived to produce a variety, all embodying the same fundamental principle. The one here illustrated, is, however, the most effective.

This lathing is easily handled and applied, there are no cutting edges or points to injure the hands, it is readily cut to any size with an ordinary pair of tinsmith's shears and can be readily bent into any form. It possesses a most perfect clinch or bond for the mortar, can be plastered on both sides and does not permit a free escape or waste of mortar. Plasmatic in its nature it is an inestimable element in catacoustics, and it affords excellent properties in the general accomplishment of the good acoustics of a building.

This invention goes far into the solution of the question of inexpensive, fireproof construction, for it readily permits of this desired result being carried out, whether in the cottage or mansion. Any timber-constructed building becomes absolutely incombustible, rendered so by the plasterer's art, aided by such means as will effectually hold the mortar and thus protect the timber. The application of a good metallic lathing at once renders a building, Fire, Water, Earthquake and Vermin proof.



No excuse can be offered or reason assigned why timber-constructed buildings shall be consumed by fire. The rendering

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of such a building incombustible has many times been successfully demonstrated: indeed, there is no reason why an organ (which of necessity must be of dry combustible material) may not be consumed by fire and yet not imperil the lives of the congregation or the church structure. Over a century has passed since a most successful demonstration was recorded. In the "*Percy Anecdotes on Science*," appears the following:

"In the year 1777, Lord Mahon, afterward Earl Stanhope, so distinguished by his scientific discoveries, exhibited some experiments at the family seat, Chevering Kent, to prove the certain, cheap and simple method of securing houses against fire, without making use of either brick, stone, tiles, iron, or any such incombustible materials. A building entirely constructed of wood and of lath and plaster, with a very small quantity of sand laid upon the floors, which were of deal, (pine), was attempted to be set on fire by means of an enormous quantity of dry burning fuel—several scores of very large kiln fagots, straw, pitch and other combustibles—with which the lower room of this building was filled rom the floor to the ceiling, almost in every part, but to the great astonishment of all the persons who witnessed this interesting experiment and who saw the flames come out of all the doors and windows, on every side of the lower room, this whole mass of fire burnt out without doing the least damage, beyond discoloration by smoke. The whole building appeared to be incombustible."

This lathing is indispensable to the enclosing of elevator and dumb-waiter shafts, to partitions where a double plastered face is made from one to two inches in thickness, thus effecting a great saving in floor space. It is invaluable for fireproof rooms for County Courthouses, where records may always be kept secure from fire, affording a fireproof room in lieu of the usual contracted iron safe. In fact, wherever lathing is required for any purpose whatever, metallic lathing should be used to the utter exclusion of wood. Its use has also been extended to our modern steamships. Metal lathing is surely superseding wood to the very great advantage of the building art. This progressive age is fast consigning it to the dark ages to which it surely belongs.

GEO. HAYES,
New York, N. Y.

RED AND WHITE LEAD.

We are sometimes asked: "How does Red Lead differ from White Lead?" and "Is Red Lead better than White Lead in painting iron?"

Red Lead is pure lead plus oxygen.

White Lead is pure lead plus carbonic acid gas.

Both are from the same base, the pure metal, lead. Both can, if pure, be reduced back to the metal by the elimination of their respective gases, showing their common origin. Their difference in color, physical properties, and value as paint, arises solely from the subjection of the metallic lead to one or the other of these gases in excess, by which it is disintegrated and with which it combines, forming either white or red lead as the case may be.

The preference given to Red Lead as a paint for iron and steel is principally on account of its absolute impermeability and its elastic qualities. White Lead makes a durable paint on iron, much more so than any other save Red Lead; but the largest consumers of paint for metal unite on the red oxide of lead as the best preservative of iron or steel, as do those who use the greatest quantities of paint for wood unhesitatingly declare for carbonate of lead for their purposes.

The specifications of the Michigan Central Railroad call for twenty-one pounds of Red Lead to the gallon of paint, those of the Third Avenue Bridge, New York City, the ratio of three and a half of Red Lead to one of linseed oil by weight, while the Pennsylvania Railroad's new Broad Street Passenger Station in Philadelphia took not less than twenty pounds of Red Lead to the gallon.

With these as a basis, a leading manufacturer of both Red Lead and oxide-of-iron pigment obtained the results indicated below, opposite the respective mixtures:

20 lbs. Red Lead, 5½ " raw oil,	One gallon of paint, and covered 755 square feet.
20 " Red Lead, 5 " raw oil, ½ pint Japan,	One gallon of paint, and covered 1,080 square feet.
20 lbs. Red Lead, 5½ " boiled oil,	One gallon of paint, and covered 1,200 square feet.
6½ " metallic brown in oil, 5½ " raw oil, ½ pint Japan,	One gallon of paint, and covered 693 square feet.

The mixture of "metallic" makes about equal portions of pigment and vehicle by weight, which is what is usually recommended.

In the above experiments the paint was applied to similar surfaces, the vertical sides of oil tanks. The tests were impartially made. However, no rigid figures, applicable to all cases, can be given, as covering-power varies with conditions: the weather, the thoroughness with which the paint is brushed, etc.

Theoretically and for dry, warm, bright weather, Red Lead should be used with raw oil and no drier, Red Lead itself being a natural drier. By so doing, chemical union between pigment and oil is most complete and the resultant paint more durable. However, for ordinary service to add a small quantity of Japan, or to use pure boiled linseed oil, is customary; by so doing a more viscous vehicle is had, which better sustains the heavy particles of Red Lead, thereby preventing running on vertical surfaces; and possibly giving greater covering.

Though we are not prepared to advise the use of turpentine, in ship-yards, where owing to time-contracts it is often necessary to paint in damp or freezing weather, it is frequently employed. In this connection we quote from Edward H. Sawyer, master-painter of the Marine Department of the Maryland Steel Co., who has had many years' experience in applying Red Lead in large quantities, as follows:

"Thoroughly clean the iron, and use three-fourths pure linseed oil and one-fourth turpentine for first and second coats, with sufficient dryer added after to set well in twenty-four hours, allowing five or six days between coats. The third coat, an oil coat, which will present, when finished, a full gloss, and will have the appearance of a varnished surface. The lead will wear a long time and keep hard."

For convenience, when it is desired not to use the Red Lead paint within the shortest possible time after mixing, it is a common practice to introduce just enough vehicle to form a thick, tough paste, which will keep for several days without hardening. As paint is wanted for use, this paste is thinned down to the proper consistency for spreading and applied at once, care being taken to leave the paint-pots empty at night.

EXPENSE.—COST OF RED LEAD COMPARED WITH OTHER PAINTS. THE WRONG AND THE RIGHT WAY OF ESTIMATING FIRST COST.

The expert disinterested testimony of consumers fully establishes the economy of Red Lead on the score of durability and superior protection to the iron. There is another class however, to whom, owing possibly to limited resources or to the desire to make the best annual showing, first cost alone will appeal. To these we would say not to make estimates per gallon of measure, but per gallon of covering capacity. Equal volumes of Red Lead and oxide-of-iron paint will make the first cost favor the latter, but the given volume of Red Lead paint will cover more than that of the oxide-of-iron. Hence, the difference in first cost is very much reduced. In fact, the official report of one of the largest trunk lines, all of whose figures we have not permission to publish, goes to show that Red Lead paint is actually the cheaper in first cost.

In covering tests recently made under the writer's auspices:

20 lbs. Red Lead, 5½ " raw oil,	One gallon of paint, and covered 755 square feet.
20 " Red Lead, 5 " raw oil, ½ " Japan,	One gallon of paint, and covered 1,080 square feet.
20 " Red Lead, 5½ " boiled oil,	One gallon of paint, and covered 1,200 square feet.

Same conditions were present in all of these tests. In the Japan and boiled-oil mixtures, practically no running was observed. I would add that the second coat of Red Lead, however mixed, will run less than the first.

Comparison of Red Lead with paints offered for iron or steel other than oxide-of-iron are hardly in order, as these are principally in the form of proprietary goods — mixed paints — the ingredients of which are known only to the makers and the character and performance of which will vary.

By kind permission of Mr. C. D. Purdon, bridge engineer of the Atchison, Topeka and Santa Fe Railroad, we submit herewith his itimized bill of expense for painting an ordinary piece of bridge-work with Red Lead and lamp black, the painters being of the regular railroad force.

Two coats of Red Lead on six spans of 54 ft. Each deck-plate girder took 600 lbs. Red Lead, 20 lbs. lamp black in oil, 50 gals. boiled linseed oil, 5 gals. Japan, 2 gals. turps, and $118.30 for labor — $.5775 per lineal foot or .088c. per lb.

Knowing the area from the above figures, Mr. Purdon estimates:

Red lead.....	0.4 lbs.	Material, $.0458 per square yard.
Lamp black in oil.	0.0133 "	
Boiled linseed oil.	0.0333 gals.	
Japan.....	0.0033 "	
Turps.....	0.0013 "	
Brushes.....	0.45 cts.	
Labor.....	$.0788 per square yard.	

NATIONAL LEAD COMPANY,
1 Broadway, New York, N. Y.

POROUS TERRA-COTTA.

For the information of those who are not entirely familiar with the material substance of "Porous Terra-Cotta," we offer the following explanation: It is a mixture of clay and sawdust, or any other combustible matter can be substituted (in place of sawdust) such as fine shavings, tan-bark, charcoal, etc. After the compound is properly mixed, the brick or tiles are moulded, and when sufficiently dry, are placed in a kiln prepared for the purpose, and subjected to an intense heat, adequate to consume all the combustible mixture, leaving the brick porous, and at the same time reducing the weight materially — the fire proof

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qualities remaining intact. This material is utilized in many ways; as it readily admits driving of nails, and being of a tenacious quality, holds equally as fast as if driven in wood. For arches, partitions, furring, column covering, roof and ceiling tiles, etc., it is particularly adapted. It receives and holds plaster admirably.

We justly pride ourselves upon the superior quality of this material, being thoroughly uniform in size and burning, things which are very essential.

In the past year we have perfected machines to make this material for arches, between iron beams for floors, of any size. It is thoroughly burned, besides being light in weight, retains its porosity, making a strong and very desirable arch.

It is very essential in making a building fire-proof that all precautionary measures should be taken, and a very important feature is the protection of the outside or bearing walls, for which we manufacture Furring Tiles either of Hard Burnt Clay or Porous Terra-Cotta material. It prevents all dampness from penetrating, besides giving a circulation of air between the wall and furring tiles.

This mode entirely dispenses with the using of lath, as plaster can be applied directly on tiles. They are secured to the wall by setting same in gauged mortar, also by the use of flat-headed nails driven into the joints of the brick work at intervals.

Where Porous Terra-Cotta furring is used, nails can be driven in any part of them.

The construction of fire-proof partitions made of Hollow Burnt Clay and Porous Terra-Cotta Blocks have many invaluable advantages other than their fireproof qualities.

They have the greatest degree of strength combined with lightness, are entirely vermin proof and do not transmit cold or heat. Being hollow, all sound is deadened, and they are absolutely free from dampness.

The importance of these undisputed facts is apparent.

A partition built of these blocks is the most substantial form at present used.

It is self-supporting, and perfectly secure against fire. The plaster is applied directly on the brick, the same being grooved or dove-tailed on the surface to allow the plaster a firm hold.

They can be placed in position by any bricklayer in one-third the time required to lay common or ordinary red brick. We manufacture different sizes and of various thicknesses to meet all requirements.

Wherever it is necessary to drive a nail for the securing of base boards or wainscoting, the Porous Terra-Cotta Blocks are used. A large quantity of all kinds always on hand, ready for prompt shipment or delivery.

We have been asked so frequently for a two-inch Partition, different from the present method of construction, that we feel it is incumbent on us to introduce our latest system of two-inch Porous Terra-Cotta Partition, which we claim has many advantages over any other form now in use.

This Partition is made with two-inch blocks, one connected to the other by a galvanized-iron clamp; the bottom and top courses are secured to the floor and ceiling by means of a galvanized-iron "shoe," (the clamps and shoes weighing two ounces each). No support in the shape of iron-work required. Neither is it necessary to use mortar. The blocks can be put up by either carpenter or mason. This Partition is stronger than any other two-inch partition on the market, and we feel assured it will meet all the requirements of the trade.

HENRY MAURER & SON,
NEW YORK, N. Y.

HINTS ON PERFECT VENTILATION.

HOUSE HEATING IN GENERAL. Under ordinary circumstances, the heating of a house with the usual hot-air furnace is the method most likely to be employed, and under proper architectural supervision is as good a method as can be devised. Under such circumstances, however, it is apt to be a very expensive method of heating, and it is also apt to be very unsatisfactory, on account of the "stuffy" feeling so generally prevalent in the rooms, particularly when the weather is cold. With any problem so extremely simple as house heating, it is marvellous that it has not been so thoroughly ventilated (which is more than most houses are) as to be fully understood by every family owning or renting a house.

The situation in the average dwelling is about as follows: viz. The cellar instead of being cold, as it should be, is in the ordinary house, even in the coldest weather, the most comfortable room in it, and this is particularly the case where "portable heaters" are used. A large amount of the heat that is generated is radiated in the cellar and there is a great loss of three important items: (1) Loss of money. (2) Loss of comfort. (3) Loss of health.

Money is lost because coal is burned to no purpose. Coal is burned to heat the cellar, while the rooms and halls up-stairs are uncomfortably cold. To remedy this the heaters are "pushed" and more coal is burned, the cellar made still hotter and, at last, the rooms made comfortable — say 70° Fahrenheit — by burning twice the coal necessary to effect this.

"Pushing" the heater burns out the fire-pot, lets gas through the house and entails a heavy expense upon the owner, so that he has not only extra coal to buy, but also extra repairs to pay for to the furnace man, and these, as a rule, are by no means light.

A large part of the coal can be saved if when the house is built, care is taken to line each recess in wall or partition with Magnesia Sectional Covering Blocks, and then to run the tin heat-flues within these in the usual manner.

There are probably no words or phrases in the English (or any other) language which would so thoroughly convince a person of the truth of this statement as the mere fact of living in a house with the recesses of the heat-flues so lined, and having to pay for the coal. The delight — the luxury — of burning coal and receiving a good equivalent of heat therefor must be felt to be appreciated.

The cellar is cool when the heat-flue recesses in the walls or between the partitions are thoroughly lined with Magnesia Blocks. The heaters themselves, if "portable," must be encased in Magnesia Blocks, or if of the ordinary type, "bricked in," must be doubly bricked with Magnesia Blocks of standard thickness interposed between the two walls of brick.

Heat is generated in the furnace by the consumption of coal; and this heat should be delivered into the rooms as fast as it is created in the furnace. Now, as the heating apparatus is ordinarily installed, this does not occur because the heat-flues run between the partitions, lined perhaps with a few trifling sheets of asbestos lining paper, that are only useful in the case of sparks, which rarely happen, and this allows for a free circulation of air around the heat-pipes, chilling them always, no matter what the season may be (since they are always hotter than the air which freely circulates around them) and causing the air to circulate only sluggishly through them. Cold rooms are the result.

When the pipes are covered with Magnesia Sectional Blocks, however, the heat generated in the furnace is carried up to the living rooms by the fact of the hot-air pipes being kept hot, while radiation in the walls and partitions is prevented and a strong upward draught of warmed air is the result.

Perfect ventilation is secured in this manner, the rooms being constantly flooded with warm-air. By this means all the doors can be thrown open throughout the entire house, which is filled with a delightful, temperate atmosphere, without a trace of "stuffiness" anywhere. Congestive headache — that constant bane of illy-ventilated, furnace-heated houses — is unknown, while the risk of pneumonia, which is always an attendant of life in overheated rooms, is done away with.

The secret of warming a house is to warm it by throwing into the rooms large volumes of comfortably warmed air. To do this requires only the proper cold-air in-take, which must be large at the furnace, which, if everything is thoroughly well-covered with Magnesia Sectional Blocks, may be smaller than usual, and with Magnesia protected furnaces, Magnesia lined flue recesses, or Magnesia covered heat-pipes, a very large amount of coal will be saved. because it will not be necessary to burn it in order to warm the house, and the great physical comfort which attends perfect ventilation can be secured in any furnace-heated house. Headaches are banished, while the danger of pneumonia is greatly lessened by the thorough ventilation.

Ventilate the house with warm air, and thus secure the greatest comfort with the least cost for coal, the least attention to the furnaces and the least bills for repairs that you have ever known.

KEASBEY & MATTISON COMPANY,
AMBLER, PA.

THE GREAT CHURCH LIGHT.

1. WE know how to make light for churches and public buildings, because we don't make anything else.

2. In the oneness of our business is the success of it.

3. Our thirty-seventh year in public lighting.

4. We were born into our business, and brought up in the midst of it.

5. We have lighted twenty thousand churches and public buildings.

6. We always suit. If we didn't, we wouldn't be as successful as we are.

7. The five million folks who regularly sit under the Frink light say that it is the brightest.

8. We have the best there is in light-making, all fashioned with utmost skill.

9. We are honest because we want to be, and because it pays us to be. Foolish indeed would we be to risk thirty-seven years of growing reputation.

10. We will not sell poor fixtures.

11. Our system of lighting, lights in the full flood of steadfast light, at the minimum of respectable cost.

12. Folks copy our ideas, but they don't imitate the quality of our light, for they can't.

13. We originated successful church lighting.

14. We don't fear competition.

15. Those who want the best will have our light.

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ALSEN'S PORTLAND CEMENT

is the strongest and most serviceable Cement made, and will permit the admixture of a larger amount of sand or gravel with less loss of strength than any other brand; it is therefore the most economical. It is the finest ground cement made, and has the largest bulk to the barrel.

The following test, made in actual work, by Col. D. C. Houston, Corps of Engineers, U. S. A., at the sea wall around Governor's Island, New York Harbor, has never been equalled by any other cement. It is as follows: Tensile strength per square inch, one day, 384 pounds; seven days, 600 pounds; thirty days, 818 pounds.

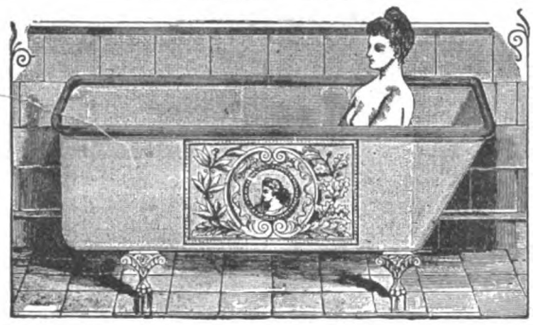
For Sidewalks it gives the best color, and the most endurable wearing surface. Most of the prominent Railroad Bridges and the large Office Buildings of the country stand upon a foundation of concrete made of ALSEN'S CEMENT.

Alsen's Portland Cement Works, New York Office, 143 Liberty Street.

THE BISCHOFF SHEET STEEL BATH-TUB.

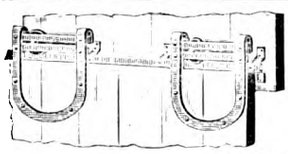
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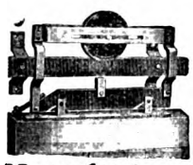
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MATERIAL THE BEST. NO BREAKAGE.
Ease of Movement. *Always in Order.*



LANE'S Patent Noiseless Steel Parlor Door Hanger.

Hanger is made of steel throughout, including wheel, except solid interior leather tread, causing to roll noiselessly.
Single steel track instead of double wood rail.
Ask your Hardware dealer, and send for Circular.

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16. We haven't a competitor.
17. We have many imitators.
18. Our reflectors reflect.
19. There are reflectors which only try to.
20. Our glass is as good as glass can be. There can't be better.
21. Sometimes somebody says there is just as good for less money. He knows better.
22. We are the largest makers.
23. Others in our business cannot do better than we can; they ought not to do as well.
24. We make our light.
25. Others buy of others.
26. Our customers pay only one profit; that as small as profit can be.
27. Tell us about your church: height and shape of ceiling, gallery if you have one, style of architecture.
28. We'll tell you what it will cost to light it, and make up designs for nothing.
29. It doesn't cost any more to have lights to match your church than it does to buy ready-made, and no more to keep.
30. We have the best light at the cost of a poor light.
31. We light halls, ante-rooms, lecture-rooms, and public buildings, by oil, gas, or electricity.
32. We want you to write to us.
33. Our advice, and the opinions and designs of artists in lighting, are yours for the asking.
34. No matter about an order now.
35. Let us tell you how to light.
36. The rest will take care of itself.
37. We take all chances.

I. P. FRINK,
New York.

ART EXHIBITION OF NEW TIFFANY GLASS WARE.

The advance made by America in the promotion of industrial art enterprises is a strong evidence of the tireless energy of its people. The manifestation of this is shown particularly in the decorative arts, nowhere more markedly than in the development and use of glass. All are familiar with the marvels that have been accomplished in colored-glass windows. The leader in this particular branch of art, Mr. Louis C. Tiffany of New York, has become interested in an endeavor to produce glass vases which will rival not only the work of the ancients, but also of the Venetians, both in color and form. That he has accomplished his aims cannot be doubted. More than that, he has made a number of very original departures and discoveries, all of great artistic value.

All those who have studied the glass of the Egyptians, Phœnicians and Romans are familiar with their remarkable combinations of colors, ingenious arrangements of glass over glass, and beauty of form. All of these points seem to have been in the mind of Mr. Tiffany when he made his experiment in blown glass.

There is now on exhibition at the galleries of Williams & Everett, 190 Boylston Street, Boston, Mass., a number of examples of this latest effort of the artist in the work of glass making. Vases of every imaginable form and color, in flat, polished and iridescent surfaces, almost every piece being unique and an object of virtu.

All who are interested in the subject should visit this exhibit and examine for themselves what Mr. Tiffany has accomplished. The exhibition will remain open until and including Saturday, June 2. Tickets of admission can be obtained, free of charge, by application in writing to Mr. Edwin Stanton George, Newtonville, Mass., at any time prior to May 31, 1894.

NOTES.

The very satisfactory results obtained with the Gorton Boiler in heating many notable educational institutions during the past winter, has demonstrated the desirability of its use wherever a healthful, economical and efficient system is wanted. The Gorton & Lidgerwood Company, 96 Liberty Street, New York City, sole manufacturers, report a good spring business.

Messrs. Hazlehurst & Huckel, architects of Philadelphia, have issued in very good form an illustrated catalogue showing some of their work which, doubtless, they would be glad to send free to any one who might be influenced to become their client. As the range of subject matter is wide, embracing churches, houses, stables and mercantile buildings, any one about to build can, by their aid, very readily form a just idea of the character of the work which these gentlemen would be likely to execute.

We had supposed that novelties in the way of calendars had been exhausted long before this, but the Northwestern Terra-Cotta Company of Chicago have proved once more the invincibility of man's inventive powers in this respect. Their terra-cotta tablet with its Moorish ornamentation is not the sort of calendar which the architect is likely to throw into the waste-basket, — it would hardly make good paper stock for the junk-dealer — and it is quite likely to find for a while, that coveted place "on your office wall," that manufacturers seem to think is so unlimited in area and devoted especially to their service.

At a recent meeting of the stockholders of the Gurney Hot-Water Heater Co., of Boston, Mass., it was unanimously voted that the name of the Company be changed to the Gurney Heater Mfg. Co., instead of as heretofore the Gurney Hot-Water Heater Co. The company therefore, will, on and after the first of June be known under the title of the Gurney Heater Mfg. Co. The officers of the company are: Edward Gurney, President; John A. Fish, Vice-President; John M. Paisley, Treasurer, and Wm. T. Isaac, Secretary.

The company state that as they have added to their list of manufactures steam boilers and steam radiation, and inasmuch as the former designation of the company had limited its apparent operations to water-heating apparatus, they decided to change its name slightly as above, in order to specify without radical alteration more fully and broadly the field of its future operations. They sincerely trust that under the new title, Gurney Heater Mfg. Co., that their many customers will contribute in broadening, in fact, the operations of the company. They promise, on their part, to do all that lies in their power to insure superior goods with prompt and efficient service.

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